The Dissertation Committee for Marina Enrica Niznik
certifies that this is the approved version of the following dissertation:

AN EXPLORATORY STUDY OF THE IMPLEMENTATION AND TEACHER OUTCOMES OF A PROGRAM TO TRAIN ELEMENTARY EDUCATORS ABOUT ADHD IN THE SCHOOLS

Committee:

_____
Deborah J. Tharinger, Supervisor

_____
Gary D. Borich, Supervisor

_____
Margaret Semrud-Clikeman

_____
Timothy Z. Keith

_____
Martha N. Ovando

AN EXPLORATORY STUDY OF THE IMPLEMENTATION AND TEACHER OUTCOMES OF A PROGRAM TO TRAIN ELEMENTARY EDUCATORS ABOUT ADHD IN THE SCHOOLS

by

Marina Enrica Niznik, B.S., M.A.

Dissertation

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

In Partial Fulfillment

Of the Requirements

For the Degree of

Doctor of Philosophy

The University of Texas at Austin

August 2004

Dedication

I dedicate this to those who never doubted me and my ability

to make my dreams come true.

To my husband and best friend, George A. Niznik,

and to my loving parents, Giuseppe and Elisa Campagiorni.

Acknowledgments

I would like to gratefully acknowledge and thank Dr. Deborah Tharinger for her support, guidance, and commitment to me and this project as a committee chairperson for as long as I have been working on this dissertation. Your willingness to see me through from the early stages to the end of this long journey is unparalleled and greatly appreciated. I would also like to thank Dr. Gary Borich for his willingness to serve as co-chairperson in the later stages of this project. You provided very clear guidance at every juncture and my research is the better for it. I would also like to thank the committee members. You significantly helped shape and improve my work.

Equally, I would like to thank the wonderful people at the Cypress-Fairbanks Independent School District, who supported my research in numerous ways. Firstly, I would like to thank my supervisor, colleague, and friend, Dr. Scott Poland, for giving me the opportunity to work with his outstanding team in the warm, collaborative environment which he has created as the Director of Psychological Services. I particularly appreciate, Scott, the opportunity you presented to me to propose the development of a district-wide training program on ADHD, which became the foundation of this project; as well as your continual, genuine support as I worked toward completing my research. I would also like to thank Dr. Cheryl Salyards, Assistant to the Superintendent, for her interest and

commitment in training educators about ADHD. I thank you for funding and otherwise supporting the development of the training program and for greatly promoting its use among staff. Great appreciation and thanks are also due to the exceptional educators in the district, particularly those who attended my numerous training sessions and who willingly completed measures for my data collection because they truly want to do all they can to assist students.

Most importantly, I would like to thank my parents, Giuseppe and Elisa Campagiorni, for instilling in me the value of education and making innumerable sacrifices to ensure that I could have every opportunity imaginable. I was able to do this because you planted the seeds to make it possible and never once doubted that my dream would come to fruition. Mommy and Daddy, you have been the best teachers I could ever hope for and I love you both very much.

Above all else, I would like to express my awe of my husband, George. You are the most giving, loving, and kind person I have ever met. You have completely taken this long journey with me: standing beside me providing continual encouragement; guiding me when I lost my way; or ready to comfort me when the challenge seemed insurmountable. George, without your unwavering devotion and willingness to do whatever was necessary, achieving this goal of mine would never have been possible. I am truly indebted to you and feel so blessed to be able to share the greater journey through life with you. After all these years, you continue to be my very best friend. I love you.

AN EXPLORATORY STUDY OF THE IMPLEMENTATION AND TEACHER OUTCOMES OF A PROGRAM TO TRAIN ELEMENTARY EDUCATORS ABOUT ADHD IN THE SCHOOLS

Publication No._____

Marina Enrica Niznik, Ph.D.
The University of Texas at Austin, 2004

Supervisors: Deborah J. Tharinger
Gary D. Borich

This study explored the implementation and outcomes of a district-wide teacher inservice training program on Attention-Deficit/Hyperactivity Disorder (ADHD). Outcomes with regard to teacher knowledge about ADHD, perceived teacher confidence in working with students with ADHD, and teacher attitudes toward mainstreaming students with ADHD were investigated. Teacher efficacy was also examined. Theoretical linkages among the aforementioned constructs were explored and participant satisfaction with the inservice program was assessed. Participants, elementary school teachers (N=47), responded to several self-report measures prior to, and immediately following, the presented inservice training program. One multiple-choice measure, the Educator ADHD Knowledge Form, was utilized, as were several Likert-type scales, including: Perceived Confidence in Working with Students with ADHD, Teacher Attitudes Toward

Mainstreaming Students with ADHD, and the Teacher Efficacy Scale. The Demographic Information Form was used to solicit information describing the participants. The Participant Satisfaction Form was administered to assess the extent to which the training program met the identified needs of the participants. Teacher outcome results of this study demonstrated that teacher knowledge and teacher perceived confidence in working with students with ADHD significantly improved as a result of the training program. Teacher attitudes toward mainstreaming students with ADHD did not improve. With regard to theoretical linkages, results revealed that teacher perceived confidence in working with students with ADHD was significantly correlated to teacher attitudes toward mainstreaming students with ADHD. Additionally, teacher efficacy was found to be significantly correlated to teacher perceived confidence in working with students with ADHD. Relationships among: teacher efficacy and teacher knowledge about ADHD; teacher efficacy and teacher attitudes toward mainstreaming; teacher knowledge and teacher perceived confidence in working with students with ADHD; were not found to be significant. Results also reflected participant satisfaction with the inservice training program presented on ADHD and the extent to which it met their training needs. Limitations and implications for theory and practice are noted. Suggested future research directions include similarly assessing other school staff, assessing additional

effects of the training within the classroom setting, and exploring teacher factors with regard to varying degrees of severity of ADHD among students.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER ONE

INTRODUCTION

Attention-deficit/hyperactivity disorder (ADHD) is currently considered the most prevalent disorder impacting children in the United States (Barkley, 1998). Unavoidably, the effects of this disorder greatly influence the school functioning of these children (MTA Cooperative Group, 1999a; 1999b), as it is the very tasks that are expected within the academic environment that are most compromised among students with ADHD (Sciutto, Terjesen, & Frank, 2000). Approximately 3-5% of all students meet the diagnostic criteria for ADHD (see Appendix A) which translates to about one student per classroom (American Psychiatric Association, 1994; Barkley, 1998; DuPaul, Stoner, & O'Reilly 2002; Pelham, 1982). Despite being one of the most well-studied childhood disorders (Barkley, 2003), the impact of this disorder on classroom learning (DuPaul & Stoner, 1994), and school-based methods to assist teachers in working with these students warrant further research (Reid, Vasa, Maag, & Wright, 1994).

The manifestation of ADHD interferes with a student's ability to effectively and consistently meet the demands of the classroom, as the disorder can impinge on academic, behavioral, social and emotional domains of functioning within the school setting (Barkley, 1998; Bradley-Klug, Shapiro, & DuPaul 1997; Cohen, Becker, & Campbell, 1990; DuPaul & Stoner, 1994; Glass & Wegar, 2000; Schaub, 1998). Though impairments typically surface in

childhood, commonly they persist into adolescence and adulthood (Bradley-Klug et al., 1997; Cohen et al., 1990; Teeter, 1998).

Academically, students with ADHD under perform compared to their intellectual ability as they fail to follow directions, have difficulty sustaining attention to instructions, have poor work completion, demonstrate poor test performance, and exhibit learning difficulties (Barkley, 1998; DuPaul & Stoner, 1994). Behaviorally, they inconsistently complete independent seatwork, are disorganized, leave their assigned area, engage in excessive motor movements, blurt out in class, display reduced motivation and effort toward non-preferred tasks, and rush through tasks (Barkley, 1990; DuPaul & Stoner, 1994; Teeter, 1998). Socially, the majority of these students demonstrates difficulty in reciprocal interactions with peers and has been shown to have a compromised ability to sustain friendships (Barkley, 1990; 1998; DuPaul & Stoner, 1994; Frederick & Olmi, 1994). Emotionally, they tend to display poor frustration tolerance, reduced self-esteem, and poor coping skills (Barkley, 1998; DuPaul & Stoner, 1994; Hoff, Doepke, & Landau, 2002). Considering the well-documented findings that the majority of students with ADHD display comorbid learning, behavioral, and/or emotional disorders, this disorder can influence multiple domains of a students' school functioning (Barkley, 1998). Ultimately, the outcome of this disorder can be quite costly, as students with ADHD are at higher risk for school failure than the normal population (Barkley, 1990; Barkley,

Fischer, Edelbrock, & Smallish, 1990; Hinshaw, 2003; Weiss & Hechtman, 1993).

Due to the prevalence of ADHD, teachers are increasingly expected to manage the myriad of challenges that these students pose within the school setting. Though teachers are often willing to address such concerns, the majority feel poorly prepared to do so (Children and Adults with Attention Deficit Disorder [CH.A.D.D], 1992; DuPaul & Stoner, 1994; Fowler, 1992; Patton & Braithwaite, 1990; Pfiffner & Barkley, 1990; Schumm & Vaughn, 1992). Teacher preparatory programs often provide insufficient education on the identification and management of students with ADHD (Harris, 1989; Jerome, Washington, Laine, & Segal, 1999; Reid et al., 1994; Swartz, Hooper, Gut, Wakely, & Levine, 1997), which results in new teachers entering the workforce without sufficient knowledge to effectively work with these students (Swartz et al., 1997). Similarly, teachers who lack training and are presently in the workforce are expected to supplement their knowledge base with staff development efforts, yet the majority of teachers are not provided with such learning opportunities (Hawkins, Martin, Blanchard, & Brady, 1991).

As our schools continue to adapt an inclusive framework for students with special needs, commonly known as "mainstreaming," most students with ADHD, as well as those with other disabilities, will continue to be educated within the integrated general education school setting for the majority of the school day

(Buell, Hallam, Gamel-McCormick, 1999; Reid et al., 1994; Ryndak, Jackson, & Billingsley, 2000). As a result, all educators will be responsible for serving for students with special needs (Reed & Monda-Amaya, 1995; Smith, Polloway, Patton, & Dowdy, 1995) and implementing appropriate classroom accommodations for them (Bos, Nahmias, & Urban, 1997; Zentall & Stormont-Spurgin, 1995). Therefore, the education of all teachers on the disorder of ADHD and methods for improving the functioning of these students within the school setting is considered indispensable (DuPaul et al., 2002; Pfiffner & Barkley, 1998, Reid et al., 1994). In sum, "Children with this disorder are encountered in every type of school setting, therefore all educators should possess at least minimal competencies in identifying these children and designing effective educational programming to meet their needs and help them become successful, productive citizens" (DuPaul & Stoner, 1994, p. 236).

As a result of insufficient teacher knowledge and training that general education teachers receive, progressively more, the support of special programming within the school setting is being sought to assist students with ADHD. Since the clarification of the Individuals with Disabilities Education Act (IDEA) enabled students with ADHD to receive special education services under the disability category of Other Health Impairment (OHI) (Forness & Kavale, 2002), the rates for special education eligibility for OHI have dramatically increased (Danielson, Henderson, & Schiller, 2002; Forness & Kavale, 2002).

This has led to a major concern regarding the "overidentification" of students with ADHD for special services (Soodak & Podell, 1993), as many agree that the majority of students with ADHD should receive their academic instruction within the general education environment rather than within special classroom settings (Barkley, 1998; Forness & Kavale, 2002; Reid et al., 1994).

Though teachers are often willing to assist students with ADHD, research demonstrates that due to insufficient training, they are lacking not only the necessary knowledge, but also the necessary confidence to work with this population (Schumm & Vaughn, 1992; Sciutto et al., 2000). This lack of confidence is likely to translate to reduced teacher willingness to implement accommodations for students with special needs (Reid et al., 1994; Schumm & Vaughn, 1994). In contrast, research has shown that teachers with a greater sense of efficacy are more likely to engage in effective instructional strategies with students with learning and behavioral disorders (Brownell & Pajares, 1996) and are less likely to refer students for special education services (Podell & Soodak, 1993). Consequently, it appears critical to impart not only knowledge about ADHD but also to impact teacher confidence and/or efficacy during training about ADHD in order to affect more positive student outcomes.

Despite the plethora of research on ADHD, students with this disorder continue to struggle within the educational setting. It appears sensible to better inform educators about this disorder so that they might be able to provide the

accommodations necessary to increase the success of students with this disorder in the school environment. One vehicle for conveying new knowledge and increased confidence is inservice training. Inservice training has been effective for remediating deficiencies in knowledge among staff in organizational settings, such as schools (Harris, 1989; Schmuck, 1990) and advocates of school reform are supportive of these efforts (Forness & Kavale, 2002; Henson, 2001). Without question, teacher training efforts are considered to be just a portion of the multi-modal treatment plan that is often essential to assist students with ADHD. These inservice efforts, however, facilitate the management of many of the academic and related difficulties associated with ADHD within the school environment (Barkley, 1998) and are an important intervention for students. Therefore it appears prudent to provide inservice education to teachers on identification, management, and intervention services for students with ADHD within the school-work environment (Pfiffner & Barkley, 1990).

Based on the need to supplement teacher knowledge about ADHD, an educator training program was developed by the author for a large suburban school district. Anchored in current research and theory about ADHD, the two-hour inservice program entitled, *ADHD in the Schools: An Educator's Training Program* seeks to increase teacher knowledge about ADHD, including: etiology, diagnosis, developmental course, associated conditions, mandated services, and

treatment options, while also increasing teacher confidence in working with students with ADHD.

This study investigated the effectiveness of this developed ADHD inservice training program with regard to improving teacher knowledge about ADHD, perceived teacher confidence in working with students with ADHD, and teacher attitudes toward mainstreaming students with ADHD. Teacher efficacy was also investigated. Theoretical linkages among the aforementioned constructs were explored and participant satisfaction with the inservice training program was also investigated. Self-report measures were used to gather information from elementary school teachers who volunteered to participate in the training. The following research questions are addressed:

Questions Regarding Outcomes

1. Will the training program, *ADHD in the Schools,* improve teacher knowledge about ADHD?
2. Will the training program, *ADHD in the Schools*, increase teacher perceived confidence in working with students with ADHD?
3. Will the training program, *ADHD in the Schools*, improve teachers' attitudes toward mainstreaming students with ADHD?

Questions Regarding Theoretical Linkages

4. Is teacher efficacy related to teacher perceived confidence in working with students with ADHD?

5. Is teacher efficacy related to teacher attitudes toward mainstreaming students with ADHD?
6. Is teacher efficacy related to teacher knowledge about ADHD?
7. Is teacher perceived confidence in working with students with ADHD related to teacher attitudes toward mainstreaming students with ADHD?
8. Is teacher knowledge about ADHD related to teacher perceived confidence in working with students with ADHD?

Questions Regarding Participant Satisfaction

9. To what extent will the program, *ADHD in the Schools*, address the identified needs of the teachers in this district?
10. How well do participants rate the *ADHD in the Schools* training program?

CHAPTER TWO

REVIEW OF THE LITERATURE

The review that follows begins by addressing the impact of ADHD in the schools, particularly in light of the trend toward increased mainstreaming of these students within general education environments. The limited training that educators currently receive in college and in the workplace with regard to ADHD is highlighted. A discussion about teacher confidence and teacher efficacy, with regard to working with students with ADHD is next. Comments about the need for additional teacher training, specifically inservice, follow. Components of previously developed ADHD inservice training programs are then delineated and several existing programs are reviewed. A brief discussion of program evaluation and the development of the logic models that guided the refinement and study of the ADHD training program in the present study concludes the chapter.

A literature review offering a broad look at the disorder of ADHD is included in the appendix as it served as the foundation from which the teacher inservice program developed for the present study, *ADHD in the Schools: An Educator Training Program,*was based (see Appendix B). This appended review begins with a historical view of ADHD to assist with the understanding of how diagnostic practices have evolved, followed by a developmental examination of the manifestations of this disorder at each school-based stage. Research about

hypothesized etiologies, treatment options, including medication, family, school, and combined treatment is also presented.

Impact of ADHD in the School Environment

ADHD, one of the most common disorders impacting school-age children (Barkley, 1998), has its most damaging effects within the educational setting (MTA Cooperative Group, 1999a; 1999b). Impairments in major areas of functioning may appear in childhood and often continue into adolescence, thereby impacting students throughout their school years (Bradley-Klug et al., 1997; Cohen et al., 1990; Teeter, 1998). Students with ADHD comprise a fairly heterogeneous group of individuals with differing manifestations of difficulties (Barkley, 1998; DuPaul & Stoner, 1994; Pliszka et al., 1999; Swartz et al., 1997) which results in a great deal of variability in the nature of their school problems (Pliszka, Carlson, & Swanson, 1999). Often teachers, as well as parents, are challenged by the inconsistency in the school performance of students with ADHD, as they may turn in all their work one day and barely get started the next (Pliszka et al., 1999).

Manifestation of ADHD in the Classroom Environment

The core characteristics of the disorder--inattention, impulsivity, and hyperactivity--can lead to a host of related difficulties in the school setting that impact academic, behavioral, and social functioning (Barkley, 1998; DuPaul & Stoner, 1994; Pliszka et al., 1999). Within the classroom, students with ADHD

often under perform compared to their intellectual ability and display poor work productivity and achievement (Barkley, 1998; DuPaul & Stoner, 1994). They are described as not listening to directions, failing to initiate work or comply with requests, and unable to sustain attention to effortful tasks (Barkley, 1998). They inconsistently complete independent work, have poor test performance, and are disorganized (DuPaul & Stoner, 1994; Pliszka et al, 1999). They engage in excessive motor movements such as getting out of their seat, playing with inappropriate objects, and repeatedly tapping their hands and feet (DuPaul & Stoner, 1994). Frequently, they are disruptive in school as they may call out without permission, talk to peers at inappropriate times, and become angry when presented with frustrating tasks (Barkley, 1998; DuPaul & Stoner, 1994; Hoff et al., 2002).

Undeniably, students with ADHD require more assistance from their classroom teacher than their non-disabled peers (DuPaul & Stoner, 1994; Schaub, 1998). Furthermore, the usual teaching and discipline methods often are not effective for these students, which can lead to frustration and feelings of ineffectiveness for teachers (Schaub, 1998).

To comprehend the greater impact of ADHD on classroom learning, it is important to take into account the co-occurrence of other disorders with ADHD. The prevalence of comorbid learning disabilities (LD) with ADHD is estimated to be 10-25% (Richters et al., 1995). The prevalence of oppositional defiant

disorder or conduct disorder with ADHD has been found to be 43 to 93% (Biederman et al., 1991). The co-occurrence of mood disorders with ADHD ranges from 13-51% (Biederman et al., 1991). As these statistics attest, the challenges faced by the classroom teacher can be significant due to the wide effects of this disorder across multiple domains of functioning.

Students with ADHD, who have a comorbid disability, are likely to be educated in a more restrictive classroom setting (Forness & Kavale, 2002). They might be placed with students with learning problems or with those students with emotional and behavioral problems. The teachers in these classrooms might be able to manage the learning or behavioral problems alone, but are not well equipped to manage the combination of symptoms within the classroom setting of students with multiple disabilities (Forness & Kavale, 2002).

Since the manifestation of ADHD interferes with a student's ability to effectively and consistently meet the behavioral and academic demands of the classroom (Bradley-Klug et al., 1997; Cohen et al., 1990; DuPaul & Stoner, 1994; Glass & Wegar, 2000; Schaub, 1998), in greater proportion than the normal population, these students are jeopardy for school failure (Barkley, 1990; Barkley et al., 1990; Hinshaw, 2003; Weiss & Hechtman, 1993). Ultimately, 10-33% of students with ADHD may eventually drop out of school (Hinshaw, 2003).

The literature on ADHD has been plentiful. As detailed in the review that is attached (see Appendix B), research has focused on etiology, neurobiological

implications, diagnostic criteria, theoretical conceptualization of the disorder, medication management, and psychosocial treatment options, as well as school related issues. However, as has been plainly stated, "It is quite humbling to realize that although our understanding of ADHD has greatly advanced over the last several decades, children with this disorder continue to encounter significant difficulties in succeeding in our schools (DuPaul & Stoner, 1994, p. 236)."

Prevalence of ADHD

Approximately one student in each classroom (3-5% of the school-age population) across the United States meets the diagnostic criteria for ADHD (American Psychiatric Association, 1994; Barkley, 1998; DuPaul et al., 2002; Pelham, 1982), totaling approximately 2,000,000 students with ADHD in the U.S. (Forness & Kavale, 2002). Another 10% of students display behavioral characteristics associated with ADHD (Zentall & Bararck, 1979) but are not yet identified. Given this prevalence, the effect of this disorder on classroom learning can be pervasive (DuPaul & Stoner, 1994; MTA Cooperative Group 1999a; 1999b) as it is more than likely that each educator will work with approximately one student with ADHD yearly (DuPaul & Stoner, 1994).

Trend toward Inclusion

Though “inclusion” has replaced the notion of “mainstreaming,” both terms refer to placing students with disabilities within the general education classroom for at least a portion of the school day (Fuchs & Fuchs, 1991). As

schools continue to move toward an inclusive environment (Buell et al., 1999), most students with ADHD are being educated within integrated regular education school settings for the majority of the school day (Bradley & West, 1994; Bos, Nahmias, & Urban, 1997; Fuchs & Fuchs, 1994; Montague et al., 1997; Reid et al., 1994; Ryndak, et al., 2000; Smith et al., 1995). As a result, most educators will be increasingly responsible for serving students with special needs (Reed & Monda-Amaya, 1995; Smith et al., 1995) and making appropriate classroom accommodations for them (Bos et al., 1997; Zentall & Stormont-Spurgin, 1995).

The Individuals with Disabilities Education Act (IDEA) mandates that children with disabilities are to be educated in the least restrictive environment, with their nondisabled peers, with appropriate supports and services to the maximum extent possible given their disability (Downing, Ryndak, & Clark, 2000). As a result, various models of service delivery have evolved. The majority of these models however, adhere to the concept that substantial changes are to be made in the mainstream environment to make it more accommodating for the individual needs of all students, including those with disabilities (Ryndak et al., 2000).

School reform movements, such as inclusion and the Regular Education Initiative (REI) aim to reduce pull-out programs for students with disabilities (Smith et al., 1995). Advocates of full inclusion purport that the general education environment is more desirable than pull-out settings as it provides

enriched, normalized learning experiences (Schumm & Vaughn, 1991) and exposure to non-disabled peers allow students with disabilities to be better prepared for the real-world (Forness & Kavale, 2002). The assumption is that the A range of service delivery options are considered from educating students with disabilities in the regular education environment, to providing various levels of special education support, such as a paraprofessional aide, or special education teacher in the regular classroom, rather than the most restrictive placement of pulling the student out to a special education classroom (Forness & Kavale, 2002). Research on which service delivery model is more advantageous is mixed (Fisher et al. 1995; Hunt & Goetz, 1997). However, new amendments to the reauthorization of IDEA will likely further support continued inclusion (Yell & Shiver, 1997).

With regard to students with ADHD, legislation has clarified that these students are eligible to receive modifications in school under the IDEA and/or receive accommodations as indicated under Section 504 of the Rehabilitation Act of 1973. Though federal regulations set forth guidelines, individual school systems are often left to make decisions about the specifics of what constitutes eligibility and appropriate services under each of the existing special education disability categories (DuPaul & Stoner, 1994). This has resulted in substantial variability in programming for students with ADHD. Though IDEA entitles students with ADHD special education services if they meet delineated eligibility

criteria, there is not a specific disability category for ADHD, forcing school staff to use existing special education categories such as learning disability (LD), emotional disturbance (ED), or other health impairment (OHI).

Though the OHI category was previously reserved for students with acute medical conditions that might affect educational performance, in 1991 the U.S. Department of Education acknowledged ADHD as a disability falling within the OHI category, determining that the phrase "limited alertness that adversely affects educational performance" could include ADHD as a medical condition if diagnosed by a physician (Davila et al., 1991; Forness & Kavale, 2002).

Otherwise, schools can make needed accommodations within the regular education classroom in accordance with provisions of Section 504 of the Rehabilitation Act of 1973 (Davila et al., 1991; Smith et al., 1995). Section 504 mandates that schools make accommodations for students with ADHD based on their needs. This law was originally put forth to allow accommodations for adults with disabilities in the workplace, but has since been applied to children in schools. Since Section 504 is not a funding law, most resulting classroom modifications are minimal (Zirkel, 1995).

Although students with ADHD are entitled to special services in the schools if they demonstrate an educational need, not all students with ADHD require that level of additional support to be successful within the school environment. Researchers support that most students with ADHD can be

successfully educated within the regular education environment (Barkley, 1998; Forness & Kavale, 2002; Fowler, 1992; Kotkin, 1995; Reid et al., 1994) if teachers are trained to recognize the special needs of these students and can make the necessary classroom modifications for them (Fowler, 1992; Reid et al., 1994). However, approximately 45% of children with ADHD may be receiving special education services (Forness & Kavale, 2002).

Though "the movement toward inclusion has provided the impetus to further integrate students with disabilities in general education classrooms (Kaufman, Gerber, & Semmel, 1998), an important question is the extent to which general education teachers are prepared to meet a full range of student needs, particularly students with high-incidence disabilities (i.e., learning disabilities and behavior disorders). A second question is how best to provide this preparation through ongoing professional development" (Schumm & Vaughn, 1995, p .1). The review that follows will attempt to address this point with regard to the specific disability of ADHD.

Teacher Attitudes Toward Mainstreaming

Despite the recognized aforementioned trends, research has shown that historically, general education teachers have a negative reaction toward educating students with disabilities in their classrooms (Bacon & Schulz, 1991; Forness & Kavale, 2002; Garvar-Pinhas & Schmelkin, 1989; Whinnery, Fuchs, & Fuchs, 1991). Among the identified concerns is the issue of teachers' adequacy of their

own preparation toward educating these students (Bender, 1985). Despite increased support of mainstreaming, only 29% of general education teachers feel well enough prepared to have a student with a disability in their classroom (Scruggs & Mastropieri, 1996).

As stated earlier, federal legislation has mandated the education of students with disabilities into least restrictive environments (Schumm, Vaughn, Gordon, & Rothlein, 1994; Wilczenski, 1992). This thrust has been especially supported for students with mild disabilities, in which the general education classroom setting, with appropriate modifications, is often suggested.

However, the success of mainstreaming is largely dependent on the attitudes of the classroom teacher in making accommodations for students with special needs (Schumm, Vaughn, & Rothlein, 1994; Wilczenski, 1992). A significant amount of literature has addressed teachers' attitudes toward mainstreaming with regard to students with special needs (Schumm & Vaughn, 1992; Schumm et al., 1994). Essentially, these studies demonstrate that teachers are interested in meeting the needs of student with disabilities, but do not often feel capable of doing so (Schumm et al., 1994). Additionally, teachers are more likely to make adaptations for students with disabilities if such interventions can be done spur of the moment and without pre-planning (Schumm et al., 1994).

In turn, more positive attitudes toward mainstreaming have been found to be related to increased use of effective intervention strategies (Bender & Vail,

1995). One study investigated specific intervention strategies and teacher attitudes toward making these adaptations for students with special needs within general education classrooms. Though beyond the scope of this discussion, findings suggested that teachers rated several modifications as less desireable, perhaps because they lacked the skills and knowledge to make such changes (Schumm & Vaughn, 1991). The authors concluded that teacher training efforts should emcompass attempts to assist teachers in making adaptations for students with special needs (Schumm & Vaugh, 1991).

Previously most of the research with regard to teacher mainstreaming attitudes has been conducted without specific regard to student factors. More recently, teacher attitudes toward mainstreaming and referral for special education have been found to be related to student problem type (Meijer & Foster, 1988; Soodak & Podell, 1993). Though increasing in diversity, much of this research has investigated teacher attitudes about making adaptations for students with learning disabilities (Bender & Vail, 1995), rather than students with ADHD.

Comparing responses of regular and special education teachers, Soodak and Podell (1993) found that students with both learning and behavioral problems were more likely to be referred to special education than students with either difficulty alone, which is consistent with previous findings demonstrating that students exhibiting multiple problems are at greater risk for being referred, and later placed, into special education (Meijer & Foster, 1988). This finding does not

bode well for students with ADHD as they often exhibit both learning and behavioral deficiencies.

"In sum the….findings indicate that when teachers feel that they can have an effect, they are more likely to believe that atypical students belong in their classes" (Soodak & Podell, 1993, p. 8). There is little question that teachers will be expected to increasingly teach students with diverse needs. The success of these students within less restrictive settings will likely be related to the willingness and ability of teachers to work with these students (Schumm & Vaughn, 1991).

Increase In Special Education Referral Rates

There has been increasing concern regarding the number of students referred for special education (Gelzheiser, 1990) particularly since the benefits and risks associated with special education placement have not been empirically well established (Soodak & Podell, 1993). Some have referred to this as the "over identification phenomenon" in which students who might not necessarily require special education are excessively referred and ultimately placed (Ysseldyke & Algozzine, 1982).

Research demonstrates that from 1992 to 1997, there was a threefold increase in the number of students served within the special education category of OHI (Forness & Kavale, 2002), which is likely due to the increased awareness of the impact of ADHD in the schools. Estimates indicate that approximately 40%

(or 53,000) of students served within this category have ADHD (Forness & Kavale, 2002). Similarly, 26% (675,000 students) of the LD category is considered to be comprised of students with ADHD and 43% (190,000) of the ED category are students with ADHD (Forness & Kavale, 2002). In total, approximately 900,000 students with ADHD are being served in one of the special education categories (Forness & Kavale, 2002). However, researchers agree that the majority of students with ADHD should be able to succeed in the general education classroom (Barkley, 1998; Forness & Kavale, 2002; Fowler, 1992; Kotkin, 1995; Reid et al., 1994).

Due in part to the restricted training and knowledge among educators of how to best meet the needs of these students within the current school environment, educators are seeking special services for students with ADHD more and more. Teachers are choosing to refer these students for special education services rather than implement classroom interventions to assist them (Whinnery et al., 1991), as eluded to earlier.

Literature in this area indicates that the consideration of providing special education services to students that is not warranted should be carefully weighed. According to one author, "The labeling of children with mild handicaps to receive special education services is expensive, inefficient, [and] potentially damaging to social and emotional development…" (Wilson, 1991). In a study with students with learning disabilities, it was found that too many students were being

diagnosed with learning problems so that they might receive extra help while others who did not meet eligibility criteria were not provided assistance that they needed (Wilson, 1991). This demonstrates that rather than placing students in special education settings, efforts should be focused on collaboratively working with educators and parents so as to improve interventions within natural school settings (Wilson, 1991).

Teachers are an integral source of information regarding diagnosis and treatment of students with ADHD as they have exposure to students on a daily basis across situations and contexts (Pelham, Gagny, Gressnlade, & Milich, 1992) and are sought as informants in collecting assessment data for students with suspected disabilities. Consequently, those having limited knowledge of ADHD could potentially negatively impact referral rates for special services. Research demonstrates that teacher referral almost always leads to special education placement, which suggests that teacher decision making is pivotal to deciding which students are referred for ADHD evaluations (Sciutto et al., 2000) and ultimately placed in special education (Ysseldyke, Christenson, Pianta & Algozzine, 1983). Considering that research has revealed that teachers' decisions regarding referring a student to special education is related to the nature of the problem presented by the student (academic or behavioral), it follows that students with ADHD, exhibiting multiple types of school difficulties, are at greater risk of being referred (Soodak & Podell, 1993). Furthermore, it is

proposed that a teacher's belief in his or her effectiveness, or teacher efficacy, as discussed below, is an important factor relating to this decision making (Soodak & Podell, 1993).

Educator Training and Knowledge on ADHD

The classroom teacher, and his or her knowledge about ADHD, is vital to the educational success of students with ADHD (DuPaul et al., 2002; DuPaul & Stoner, 1994; Pfiffner & Barkley, 1998; Reid et al., 1994). Classroom teachers play a central function in assisting students with ADHD, as it is their professional responsibility to promote the learning and academic achievement of all students (DuPaul & Stoner, 1994).

Researchers have found that "teachers generally have a poor grasp on the nature, course, causes, and outcomes of ADHD, and that they harbor substantial misperceptions about appropriate interventions for this population" (Pfiffner & Barkley 1998, p. 116). Teacher knowledge about ADHD does not increase with number of years of teaching experience, according to research findings (Brook, Watemberg, & Geva, 2000). However, the success of mainstreaming students with ADHD, in part, is dependent on the ability and willingness of the general education teacher to make adaptations and accommodate for their learning differences (Madden & Slavin, 1983).

Inadequate Teacher Preservice Training

"One of the most frequent complaints voiced by parents of children with ADHD is that their children's teachers do not appear to have any background in working with students who have this disorder (DuPaul & Stoner, 1994, p. 233)." In part, this is indeed the case. Though the debilitating effects of this disorder on school functioning have been well documented, teachers receive little training about the identification of ADHD and methods for improving the classroom performance of students with this disorder (Harris, 1989; Hawkins et al., 1991; Jerome et al., 1999; Kearney & Durand, 1992; Reed & Monda-Amaya, 1995; Reid et al., 1994; Swartz et al., 1997; Worthington, Wortham, Smith, & Patterson, 1997) and have limited knowledge about how to best meet the needs of these students (CH.A.D.D., 1992; DuPaul & Stoner, 1994; Fowler, 1992; Patton & Braithwaite, 1990; Pfiffner & Barkley, 1990).

Historically, regular education teachers have received limited training on methods of working with students with special needs during their preservice coursework (Smith et al., 1995; Patton & Braithwaite, 1990). Research has found that this continues to be the case (Kearney & Durand, 1992). However, some researchers continue to support that, "Instruction in how to meet the educational and behavioral needs of children with ADHD must occur at the preservice level of training (i.e., prior to receiving teacher certification) for both general educators and special education personnel" (DuPaul & Stoner, 1994, p. 225). The extent to

which training on ADHD has become part of the teacher training curriculum is not clear (Reid et al., 1994). A cursory look at popular textbooks used in teacher training programs reveals insufficient coverage of the topic of ADHD, ranging from one page to one chapter, demonstrating a failure to provide adequate information to assist teachers in identifying these students and/or interventions to assist them (Swartz et al., 1997). Given that over 80% of teachers report receiving negligible training on ADHD (CH.A.D.D., 1992; Piccolo-Torsky & Waishwell, 1998), preservice education programs that are charged with preparing teachers to enter the workforce are seemingly falling short, resulting in teachers entering the school system inadequately prepared for the challenges that students with special needs, such as ADHD, present (Reed & Monda-Amaya, 1995; Swartz et al., 1997).

Inadequate Teacher Inservice Training

With preservice training on ADHD lacking, it is all the more crucial that further education and training be provided to educators to improve the educational outcome of these students. Studies have shown that teachers are interested in meeting the needs of students with special needs, though they often do not feel capable to do so (Schumm & Vaugh, 1992; Semmel, Abernathy, Butera, & Lesar, 1991). Therefore, it seems judicious to educate school personnel on identification, management, and intervention services for students with this disorder within the school-work environment (Pfiffner & Barkley, 1990).

Once in the workforce, only 39% of teachers surveyed indicated that they received training on ADHD (e.g., inservice, coursework, workshops) and 36% of those who had received training had received less than three hours of training on ADHD (Hawkins et al., 1991). Results from another survey indicated that only 15% of respondents had more than five hours of inservice education about ADHD (Worthington, Wortham, Smith, & Patterson, 1997). Yet, 85% of respondents reported teaching a student with ADHD, though the majority of these teachers had not been trained on methods for doing so (Hawkins et al., 1991). In sum, "If inclusion of students with [special needs] in the general education classroom is to be successful, preservice and inservice teacher education must promote teachers' fluency in addressing individual differences" (Schumm, Vaughn, Gordon, & Rothlein, 1994, p. 34).

Due to aforementioned inadequate preservice and inservice provisions, teachers have limited knowledge about how to educate students with disabilities (Smith et al., 1995), and students with ADHD in particular (Pfiffner & Barkley, 1990; DuPaul & Stoner, 1994). Research has demonstrated that regular education teachers who do not feel competent to teach children with disabilities are lacking the knowledge, skills, and confidence to do so (Schumm & Vaughn, 1992; 1995), and are often not willing to have these students in their classrooms (Whinnery et al., 1991). Yet, as Barkley (1998) summarizes, "The educational success of

children with ADHD involves…the presence of teachers actively and willingly engaged in the process of working with ADHD" (p. 459).

Inadequate Paraprofessional Training

As mentioned earlier, the general education classroom is expanding in diversity, due in part to the growing number of students with disabilities being educated along with their non-disabled peers (Giangreco, Broer, & Edelman, 2002). To address this surge in special needs students being in the regular classroom, various support models have been employed.

Since the early 1990s, it has become increasingly common to employ a paraprofessional aide to assist students with disabilities in the general education classroom (Giangreco et al., 2002). The growth in the number of paraprofessionals hired in schools has been described as an "explosion," representing an 83% increase in amount of service they provided in the schools from 1994-1999 (Giangreco et al., 2002). This rise has resulted somewhat from the increased identification of students with emotional and behavioral disabilities, in which paraprofessional supports are often recommended. However, the swell in demand has resulted in a diminished supply of qualified personnel with preferred educational backgrounds and experience. Most importantly, the training that is needed to support these new roles has been severely lacking, as most paraprofessionals receive no training prior to beginning their jobs (Giangreco et al., 2002). Though some schools encourage professional development courses,

often these classes are not relevant to paraprofessionals nor are they encouraged to take time from their work day to attend (Giangreco et al., 2002).

In review, there has been a substantial increase in the utilization of paraprofessionals to provide support services to students with disabilities, and specifically among those with ADHD. Though their roles have become progressively more instructional, the training they have received has been deemed insufficient (Arnold, et al., 1997; Burcham, Carlson, Milich, 1993; Giangreco et al., 2002; Greenhill et al., 1998; Hinshaw et al., 1997), which parallels the concerns delineated previously about inadequate training among teachers.

Intervention Implementation Obstacles

Though research has uncovered many useful strategies for the management of ADHD, obstacles have hindered the implementation of appropriate interventions. Disseminating intervention information to school staff has been particularly challenging (Montague et al., 1997; Worthington et al., 1997) as: (a) most of the research (over 90%) is being published in noneducational journals (Hocutt, McKinney, & Montague, 1993; Montague et al., 1997), (b) research is often not school-based (Burcham et al., 1993), and (c) financial and time constraints impede school practitioners from accessing the research (Worthington et al., 1997). As has been plainly stated, when teachers have a poor understanding of ADHD, its developmental course, outcome, causes,

and interventions, little will be gained from attempting classroom interventions (Pfiffner & Barkley, 1998).

Once in the classroom, there has also been concern regarding the appropriateness of the modifications being conducted for students with special needs. Research has demonstrated that "general education teachers make very few substantive instructional modifications in their classes (e.g., Baker & Zigmond, 1990; Munson, 1986), although minor modifications (e.g., shortened assignments and preferential seating) are made somewhat more frequently" (Bacon & Schulz, 1991, p. 88). A host of factors are implicated including: (a) time required to implement the intervention (Colvin, Kameenui, & Sugai, 1994; Elliott, 1988; Greene, 1997; Reid et al., 1994; Whinnery et al., 1991), (b) type of treatment (Elliott, 1988; Greene, 1997; Whinnery et al., 1991), (c) effectiveness of the intervention (Elliott, 1988; Greene, 1997), (d) classroom size (Reid et al., 1994), (e) lack of training and skill (Reid et al., 1994; Whinnery et al., 1991), (f) limited numbers of teaching assistants, (g) severity of student behavior (Elliott, 1988; Greene, 1997; Reid et al., 1994), (h) increased academic demands (Glass & Wegar, 2000), (i) appropriateness for classroom environment (Whinnery et al., 1991), (j) risk to student (Witt & Martens, 1983), (k) potential negative effect to other students (Witt & Martens, 1983), and (l) inadequate funding (Glass & Wegar, 2000).

Despite the accepted effectiveness of interventions, classroom implementation is often problematic (Schumm & Vaughn, 1991; 1995). Studies have shown that teachers often select interventions based on perceived effectiveness (Whinnery et al., 1991) rather than empirical evidence. Therefore, even among the small percentage of teachers that gain knowledge about working with students with special needs via coursework, many may lack the skills necessary to implement the interventions they select (Whinnery et al., 1991) and may not be apply the knowledge once they enter the classroom setting (McIntyre, 1995). To promote teachers' willingness to implement interventions, it might be helpful to assist them in appropriate intervention selection, based on the students' and the settings' needs, as well as helping them modify interventions as necessary (Whinnery et al., 1991). In sum, "Teacher acceptance of effective behavioral interventions may be necessary for the successful mainstreaming of students who are difficult to teach and students with mild handicaps" (Fuchs, Fuchs, Bahr, Fernstrom, & Stecher, 1990, p. 7).

Designing and fine-tuning effective intervention strategies for students with ADHD are likely to be worthwhile. However, for interventions to be used by educators they have to "appear workable" and be acceptable to the classroom teacher (DuPaul et al., 2002). In sum, if teachers are not accepting of treatments, and find them to be difficult to implement and maintain (DuPaul et al., 2002; Reid

et al., 1994) they fail to attempt them or adhere to them (Happe, 1983), which in turn impacts treatment outcome (Pisecco, Huzinec, & Curtis, 2001).

As Wolf (1978) bluntly stated, “If the participants don’t like the treatment, they may avoid it, or run away, or complain loudly. And thus, society will be less likely to use our technology, no matter how potentially effective it might be” (p. 206), ultimately supporting the view that “an unacceptable treatment may be no treatment at all” (Elliott, 1986, p. 26). Improving teacher knowledge of intervention methods may increase their willingness to teach students with special needs (Whinnery et al., 1991), and ultimately may improve the functioning of these students.

This body of research suggests that general education teachers do not routinely use the types of strategies that would facilitate learning by students with special needs in general education environments. This leads one to surmise that students with ADHD might not be receiving the type of classroom modifications necessary for them to meet their educational goals. "It has been argued that a recognizable disability such as ADHD only becomes a handicap in a non-accommodating environment (Kameenui & Simmons, 1990, p. 204)."

Impact of Limited Educator Knowledge of ADHD

The impact of limited teacher training and knowledge of ADHD on students is clear. Teachers’ perceptions of the number of students displaying ADHD characteristics significantly exceed the widely accepted percentage of 3-

5% of the school-age population (Glass & Wegar, 2000). In one study, over 70% of teachers indicated that they suspect more than 5% of the students in their classrooms as having ADHD (Glass & Wegar, 2000). Alarmingly, 36% of the teachers identified 6-15% of their students as having ADHD; 23% of teachers identified 16-25% of their students as having ADHD; and 13% of teachers identified 26% or more of their students as potentially having ADHD (Glass & Wegar, 2000). In addressing this, Glass and Wegar (2000) state, "The educational institution must be willing to carry its share of the burden when faced with children who display troublesome behavior.…Appropriate education for the teachers on how to identify the characteristics of ADHD should be stressed in the educational system, so that teachers are aware of the formal distinction between ADHD and normal childhood behavior" (p. 417). To ameliorate this problem, educators must increase their understanding and awareness of the limitations of students with this disorder.

Link between Educator Knowledge and Confidence

Research demonstrates that not only do educators have insufficient training to manage students with disabilities mainstreamed into general education, they often do not feel confident in their skills and knowledge in assisting these students (Schumm & Vaughn, 1992) and are not likely to implement accommodations on a consistent basis unless they have the knowledge, skills, and confidence to do so (Schumm, 1994). In a study of teachers, researchers found

that overall knowledge of ADHD was positively related to teachers' confidence in their ability to effectively teach a child with ADHD (Sciutto et al., 2000). Another study demonstrated that teachers with prior experience and training about ADHD reported higher perceived confidence in the ability to work with these students and make needed accommodations for them (Reid et al., 1994). Essentially, these studies demonstrate a potential link between teacher knowledge and confidence in working with students with ADHD.

Teacher Efficacy

One body of research that attempts to capture this issue of teacher confidence is the construct of teacher efficacy. There has been significant disagreement over what comprises the concept of teacher efficacy and the ensuing definitions have been equally fraught with lack of consensus. One proposed definition is, "A teacher's efficacy belief is a judgment of his or her capabilities to bring about desired outcomes of student engagement and learning, even among those students who may be difficult or unmotivated" (Tschannen-Moran & Hoy, 2001, p. 783). Another definition states, "Teacher efficacy is a subcategory of self-efficacy; it refers to an individual's beliefs about proficiency in performing the actions thought to lead to student learning" (Ross, 1994, p. 382). More simply, prominent researchers in the field state that self-efficacy is "teachers' evaluation of their abilities to bring about positive student change" (Gibson & Dembo, 1984, p. 570).

Generally, teachers with high levels of efficacy are considered as having higher confidence (Wheatley, 2002), particularly in their teaching abilities (Guskey & Passaro, 1994). More specifically, teacher efficacy has been found to be related to positive student outcomes (Gibson & Dembo, 1984, Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998) including achievement and motivation (Henson, Kogan, & Vacha-Haase, 2001; Woolfolk, Rosoff, & Hoy, 1990). Those with less teacher efficacy feel that little can be done to impact student outcomes or that they lack the skill to impact student outcomes (Gibson & Dembo, 1984).

Although some researchers continue to view teacher efficacy as a one-dimensional construct, the prevailing view is that there are two distinct dimensions of teacher efficacy: 1) personal teaching efficacy, which is a teacher's expectation that he or she will be able to perform the actions that lead to student learning and 2) general teaching efficacy, which is the belief that the teacher population's ability to perform these actions is limited by factors beyond school control (Ross, 1994). Essentially the distinction is that personal teaching efficacy is a teacher's view that he/she makes a difference and general teaching efficacy is the idea that teaching makes a difference (Meijer & Foster, 1988). Furthermore, research has suggested that these dimensions be analyzed independently since they are not correlated (Ghaith & Yaghi, 1997; Woolfolk et al., 1990).

Personal Teaching Efficacy

Upon studying the two aforementioned dimensions separately, if was found that personal teaching efficacy has been related to student outcomes, whereas general teaching efficacy has not (Soodak & Podell, 1996). For example, where personal teacher efficacy was related to referrals to special education for difficult to teach students, general teaching efficacy was not. Research has demonstrated that personal teaching efficacy may affect the selection of instructional strategies utilized in a classroom setting (Bender & Ukije, 1989; Ghaith & Yaghi, 1997) whereas "… the factor we have been calling [general] teaching efficacy may not be relevant in the decision-making of practicing teachers" (Soodak & Podell, 1996, p. 410). This supports the decision to investigate personal teaching efficacy, in the absence of general teaching efficacy, in the present study. In sum, research demonstrates that teachers who demonstrate a high sense of personal teaching efficacy are confident that they have adequate training or experience to develop new strategies, or experiment with existing ones, to overcome obstacles to student learning (Gibson & Dembo, 1984; Guskey, 1988; Tschannen-Moran & Woolfolk Hoy, 2001) and improve classroom management and control strategies for better student behavior (Woolfolk et al., 1990).

Historically, research in this area has investigated teacher efficacy across teaching situations. More recently researchers posit that, "Teachers may hold

differing efficacy beliefs for pupils having different types of problems (e.g., learning vs. behavior)" (Meijer & Foster, 1988, p. 383). This relatively new view holds that efficacy beliefs are task-specific and context-specific. In other words, teachers do not feel equally efficacious across all teaching situations (Brownell & Pajares, 1996; Wheatley, 2002). To clarify, "Teacher efficacy has been defined as both context and subject matter specific. A teacher may feel very competent in one area of study or when working with one kind of student and feel less able in other subjects or with different students" (Tschannen-Moran & Woolfolk Hoy, 2001, p. 788). Issues are being investigated in the literature with regard to the measurement of efficacy within the context of specific behaviors (Tschannen-Moran, Woolfolk Hoy & Hoy, 1998).

Relationship between Teacher Efficacy and Teacher Attitude Toward Mainstreaming

Few studies have closely examined the relationship between teacher efficacy and educator perceptions with regard to including students with disabilities in the general education setting (otherwise known as "mainstreaming") (Brownell & Pajares, 1996). However, there has been support for the idea that a teacher's sense of efficacy is critical to their acceptance of students with special needs in general education classrooms (Buell et al., 1999).

Research conducted with regular education teachers has demonstrated that teachers with a greater sense of efficacy are likely to engage in more effective

instructional practices with students with learning and behavioral problems (Brownell & Pajares, 1996). Regular education teachers with a greater sense of personal efficacy are also more likely to perceive the regular education placement as appropriate for students demonstrating difficulties (Soodak & Podell, 1993). In contrast, teachers with a greater sense of efficacy are likely to work longer with a student who is struggling (Gibson & Dembo, 1984) and are less likely to refer to difficult student for special education services (Meijer & Foster, 1988; Podell & Soodak, 1993: Soodak & Podell, 1993).

More specifically, in the Netherlands, a study was conducted that demonstrated that teachers who had greater confidence in their own teaching ability (i.e., personal teaching efficacy) were less likely to refer students for special education compared to teachers with had lower personal efficacy (Meijer & Foster, 1988). This study further found that teacher' ratings of referral chance and seriousness of student problem could be predicted by teachers' personal self-efficacy (Meijer & Foster, 1988).

Though teacher efficacy has been studied for two decades, it has only been more recently explored within the context of special education, as previously teacher efficacy research was limited to regular education settings (Coladarci & Breton, 1997). The few studies that have been related to the special education setting have found that resource teachers high in teaching efficacy tend to be better with planning, organization, and clarity of instruction, as well as more

enthusiastic and fair (Allinder, 1994). More importantly, resource teachers high in efficacy have been found to be more inclined to try a wide variety of new approaches in order to find more effective methods of instruction (Allinder, 1994). Another study found that among their sample of teachers, resource teachers' sense of efficacy was higher than that of their regular education counterparts (Coladarci & Breton, 1997).

Additional research has demonstrated that personal teaching efficacy is related to teacher attitudes toward mainstreaming (Bender & Vail, 1995; Soodak & Podell, 1996). Another study found that personal teaching efficacy, rather than general teaching efficacy, was positively correlated with teachers' attitudes toward implementing appropriate instructional interventions for students with special needs (Ghaith & Yaghi, 1997).

Therefore it appears that a relationship likely exists between efficacy and teacher's attitudes toward mainstreaming, however this relationship has not been investigated with regard to students with ADHD. In light of the current trend to investigate efficacy within specific contexts, such as student behavior type, further inquiry into this relationship with specific regard to working with students with ADHD appears warranted. Better understanding of this relationship might ultimately reduce the likelihood of teachers referring students with ADHD for special education services unnecessarily.

Inservice Education

In general, school restructuring and reform efforts have increased the emphasis on training teachers (Henson, 2001). More specifically, federal mandates for increased service provision will likely necessitate professional development efforts aimed at improved understanding of the diagnosis and manifestation of ADHD symptoms in the schools (Hakola, 1992; DuPaul & Stoner, 1994). In an attempt to address training limitations, school districts have endeavored to provide inservice training to assist teachers in working with students with ADHD across various settings. However, there has been limited empirical data to indicate that brief, didactic inservice training is effective in enhancing the knowledge and skills of educators (DuPaul & Stoner, 1994).

"The most important intervention agent in the school building is the teacher. By using effective instructional and behavior management strategies, the teacher can provide the child with AD/HD and the child's classmates a learning environment that permits all students to fully participate in classroom activities" (DuPaul et al., 2002, p. 1118). Implementation of effective classroom intervention strategies for children with ADHD (DuPaul & Eckert, 1997) necessitates increasing teacher knowledge about the disorder and interventions in order to increase school success (Barkley, 1990).

For decades, organizations have supplemented hands-on knowledge acquisition with additional training, commonly referred to as staff development,

continuing education, or inservice education. Broadly, these terms are used interchangeably to refer to a variety of educational endeavors beyond formal college education (Harris, 1989). Specifically, "inservice education is any organized effort to improve the performance of personnel in already assigned positions" (Harris, 1989, p. 1).

Schools provide additional training to their employees in order to continue to improve service delivery (Schmuck, 1990). Though many different topics can be addressed via inservice, chosen areas are often those that affect a large portion of the school staff, such as the education of students with special needs.

Staff development in the schools can serve to: (a) close the gap between research and practice by translating research findings into practical and useful applications for schools staff, (b) increase educator competence by providing them with current trends in knowledge and skills that are founded in research, and (c) support teachers that are willing and open to attempting potential strategies in order to find ones that are most effective (Montague et al., 1997).

Addressing this need, the National Joint Committee on Learning Disabilities issued a position paper requesting that "…systematic inservice programs be established for persons who are responsible for providing programs and services to individuals with learning disabilities" (National Joint Committee on Learning Disabilities [NJCLD], 1988). Other less formal mandates have been brought forth with regard to the education of students with ADHD.

"There is an abundance of material on what constitutes good professional development for teachers (see, for example, Sparks & Louks-Horsley, 1992; Darling-Hammond & McLaughlin, 1996; Little, 1993; Thompson & Zeuli, 1997; Zimpher & Howey, 1992 cited in Laine & Otto, 2000). Despite the availability of professional development research and access to examples of best practices, only a small fraction of schools incorporate these ideas…" (Laine & Otto, 2000, p. 6).

Effectiveness of Inservice Training

It is becoming apparent that too many teachers lack the necessary knowledge, skills, and training to adequately meet the needs of their diverse students. Yet professional development continues to be provided in a "piecemeal fashion" (Laine & Otto, 2002) that is mostly unrelated to overall school goals and are nonresponsive to changes in curriculum, assessment, and known best practices.

As schools continue to adopt changes due to educational reform efforts, teachers are increasingly asked to update their knowledge and skills. New expectations for students, teachers, and schools are set forth that some educators might be unprepared to meet. Professional development efforts assist educators to learn new roles and strategies to better meet these new expectations.

One study on inservice training demonstrated that 70% of respondents reported that their worst professional development experience was that provided within their school district (Sanholtz, 1999), which is quite alarming since

currently, 80% of public school teachers attend school or district sponsored inservice programs (Hirsch, Koppich, & Knapp, 1998).

Few would deny that professional development in the majority of school districts has had a small, ineffective role in the professional lives of teachers and a minor impact on student learning (Hawley & Rosenholtz, 1984) however; it has long been a requirement in states for teacher recertification. Therefore, there is significant opportunity to improve inservice education for educators, specifically regarding ADHD training.

Inservice Training for ADHD

"There are enormous opportunities for research in school-based treatment of children with ADHD as well as for improvement in teacher preparation and educational practice" (Forness & Kavale, 2002, p. 24-12). With regard to educators within the work setting, it is recommended to first train both regular and special educators on the early detection of ADHD to minimize that amount of time that passes before students receive appropriate treatment (Duncan et al., 1995; Forness et al., 1994). Additionally, it is recommended to incorporate instructional and behavioral intervention strategies that are generally useful for students with a variety of needs into educator training programs (Forness & Kavale, 2002). "Staff development…not only can assist teachers to better understand and deal with the implications of ADHD but can also extend these benefits over time as new children with ADHD enter these classrooms in

subsequent years (Forness & Kavale, 2002, p. 24-16)."

Due in part, to the efforts of the Office of Special Education Programs (OSEP), inservice education programs aimed at educators to address ADHD have been developed and evaluated. Though quite comprehensive in scope, many of these programs require significant investments of time and personnel for extended periods. Furthermore, these programs do not often address the local needs of teachers, but rather address topic areas that are broader in scope. Researchers indicate that future educational interventions should focus more on characteristics of ADHD that extend beyond the primary symptoms, as teachers were found to be less knowledgeable about the long-term prognosis and situational variations regarding students with ADHD (Sciutto et al., 2000).

CH.A.D.D. (1992), a national advocacy group for ADHD, addressed the United States Congress Subcommittee on Appropriations and recommended that "perhaps no greater impact can be made for [these] children than in the training of our nation's educators about this disability" (p. 24). Taking this idea a step further, others believe that in addition to training teachers, school-wide efforts are necessary to improve the education of students with ADHD, as stated below.

> Developing a school-wide approach to serving children with AD/HD should be part of overall school restructuring efforts and initiatives for all students, including those with disabilities. The school-wide approach should incorporate the most current knowledge about AD/HD, including

> information about identification and assessment, effective school programming, classroom management strategies and curricular adaptations for the classroom, and knowledge about recent issues in the administrative and policy arena (Kallas, Reeve, Welch, & Wright, 1997, p. 121).

Impact of Inservice On TeacherEfficacy

"To date there have been very few attempts to increase teacher efficacy through district-organized professional development" (Ross, 1994, p. 381). Many reviewed studies have measured teacher efficacy on single occasion, as a stable trait (Ross, 1994). Those that have investigated the impact of inservice efforts in effecting efficacy have yielded variable results.

One study found that efficacy beliefs in small sample of experienced teachers increased in response to an inservice program (Stein & Wang, 1988). It is noteworthy that this inservice program was one year in length. Another study investigated the effects of a "participatory teacher research" inservice training on teacher self-efficacy (Henson, 2001). Results were reflective of growth in both general and personal teaching efficacy, however, it is worth noting that this program also extended for one academic school year (Henson, 2001).

In a follow-up study, Ross (1994) explored the generalizability of previous findings by investigating the impact of an inservice program designed to provide teachers with knowledge and skills in implementing cooperative learning

techniques. Results demonstrated that the staff development program was too weak to bring about changes in the personal teaching efficacy, as the program was too short (8 months) and there were too few opportunities for teachers to acquire new skills. Additionally, findings suggested that the use of inservice knowledge, not exposure to it, contributed to noted changes in general teaching efficacy (Ross, 1994).

Other researchers have also investigated the effects of professional development on teacher efficacy (Henson, 2001; Ross 1994). Though research has established that in some cases, efficacy can be impacted by interventions (Ross, 1994), the interventions must be of sufficient duration, and the participants must utilize the acquired knowledge in order to impact their efficacy.

Some research has indicated that teachers' confidence in their ability to work with students with disabilities in the classroom can be impacted by inservice training (Buell et al., 1999). This supports the notion that increased experience or knowledge will lead to an increased sense of efficacy (Sachs, 1990).

In sum, "Although there is consistent evidence that efficacy is most malleable in the preservice years; efficacy tends to be resistant to change for experienced teachers. As such, positively impacting teachers' efficacy beliefs is unlikely outside of longer-term professional development that compels teachers to think critically about their classrooms and behave actively in instructional improvement" (Henson, 2001, p. 831). This leads to the charge that, "…we need

more studies examining the impact of inservice programs on teacher efficacy" (Ross, 1994, p. 391).

Components of Inservice Training Programs on ADHD

Culling suggestions from leading experts, national organizations, and district personnel, one group of researchers identified key areas for teacher training on ADHD (see Appendix C, Table C1 for a description) including: (a) characteristics and needs of students with ADHD, (b) policy and procedures for ADHD, (c) assessment and identification of students with ADHD, (d) interventions for students with ADHD, and (e) collaborative consultation and ADHD (Montague et al., 1997).

Others have delineated that different aspects are relevant for inservice training on ADHD, including: (a) knowledge related to the neurobiological/medical aspects of ADHD, such as, etiology, medication treatment, and the teacher's role in monitoring medication effects in school; (b) understanding ADHD from parents' and students' perspectives and the importance of working collaboratively with them; (c) knowledge about educational and behavioral strategies for accommodating students in the classroom; (d) positive attitudes and perceived competence in working with students with ADHD; and (e) interactive learning experiences including the balancing of presentations with discussions, group activities, and opportunities for reflection and application (Bos et al., 1997).

In an attempt to increase educator knowledge about ADHD, OSEP established centers and funded programs to develop and conduct training for teachers on ADHD (Worthington et al., 1997). A few of the resulting programs from these funded efforts will be discussed below.

Project Facilitate was one of the 5-year federally funded OSEP projects (see Worthington et al., 1997; see Appendix C, Table C2 for a description). This inservice education program serves to provide educators, as well as parents, with a comprehensive overview of ADHD. This program is comprised of four self-instructional content manuals: (1) ADHD General Knowledge Base, (2) Legal Issues and ADHD, (3) School-based Assessment of Children with ADHD, and (4) ADHD Interventions (Worthington et al., 1997). Features of this program include: a school-based focus, a peer-coaching emphasis, a flexible presentation format, an intensive and sustained orientation, a trainer of the trainers model, and an objectives-based model. Schools were recruited for participation in the 4-month program and evaluation. Based on pretest and posttests on each of the four manuals described above, results indicate that this program significantly increased participant knowledge in the area of ADHD (Worthington et al., 1997).

Another such OSEP project is *Striving for Compatibility*, a program designed to address the social needs of students with ADHD (Marchant & Siperstein, 1997; see Appendix C, Table C3 for a description). This program was created over a 3-year period and is comprised of a series of 2-hour after-school

workshops. Evaluation of this program revealed that although teachers were very interested in strategies that they could use with their students, the training was more effective in improving teacher's understanding of students with ADHD than improving their teaching strategies in working with these students (Marchant & Siperstein, 1997).

A Continuing Education Program on ADHD was also created as a result of an OSEP grant to the Council for Exceptional Children (CEC) (Kallas et al., 1997; see Appendix C, Table C4 for a description). This 3-year program aims to increase the knowledge and skills of special and general educators with regard to ADHD (Kallas et al., 1997). Four modules comprise the training program. A reaction evaluation indicated that participants rated the program's activities as positive with regard to content, presentation, support materials, and transferability of content to work setting (Kallas et al., 1997).

Other school-based, inservice programs on ADHD have also yielded positive results. For example, Ecoff (1992) conducted a 12-week inservice program in an elementary school and found that the program was successful at increasing teachers' attitudes and knowledge for educating students with ADHD. Overall, these programs, though comprehensive in scope, require a significant investment with regard to educator time, resources, and commitment.

Program Evaluation

Based on the aforementioned issues regarding the impact of ADHD on schools and the limited training provided to assist educators with students with ADHD, a district-wide professional development program was created by the author for a large suburban school district. The purpose of this program is to increase educator knowledge and confidence in working with students with ADHD (see Chapter 3 for a description of the training program and its development, Appendix D for the Table of Contents of this program, and Appendix B for the literature review upon which the program was based).

"Each professional development effort should be accompanied by a well-designed evaluation plan for determining its effectiveness (NCREL, 1997, p. 1)." However, "There is no one best way to conduct an evaluation" as "every evaluation situation is unique" (Patton, 2000, p. 431). Though ethics and standards provide guidelines, there are no rules an evaluator can follow to know precisely what to do in a given situation. Some theorists go so far as to say that "'good evaluation' is nothing more than 'good thinking' " (Kellogg Foundation, 1998, p. 3). It is further stated that, "Effective evaluation is not an 'event' that occurs at the end of a project, but is an ongoing process" (Kellogg Foundation, 1998, p. 3).

According to Patton (2000), "Program evaluation is the systematic collection of information about the activities, characteristics, and outcomes of programs to make judgments about the program, improve program effectiveness and/or inform decisions about future programming. Utilization-focused program evaluation (as opposed to program evaluation in general), is evaluation done for and with specific intended primary users for specific, intended uses" (Patton, 2000, p. 426-427).

"Utilization-focused evaluation begins with the premise that evaluations should be judged by their utility and actual use…" (Patton, 2000, p. 425). Focused throughout the process on the use and application of the evaluation findings, this model does not promote any specific method, theory, or content, but rather is a process by which to assist evaluators and users select the most appropriate methods for the particular situation.

"…Utilization-focused evaluation can include any evaluative purpose (formative, summative, developmental), any kind of data (quantitative, qualitative, mixed), any kind of design (e.g., naturalistic, experimental), and any kind of focus (process, outcomes, impacts, costs, and cost-benefit, among many possibilities). It is a process of making decisions about these issues in collaboration with an identified group of primary users focusing on their intended uses of evaluation" (Patton, p. 426). Though evaluation can be quite broad in scope, the present study focuses on teacher outcomes and participant reaction

only. The investigation of student outcomes, albeit important to research, is beyond the scope of this study.

Description of Logic Models

To assist in planning the evaluation of the *ADHD in the School* inservice program, logic models have been employed (see Appendices D, E, F, and G). A logic model is a roadmap of a program, depicting how a program works, "… high-lighting how it is expected to work, what activities need to come before others, and how desired outcomes are achieved (Kellogg Foundation, 1998, p. 35)." It links outcomes with program activities and theoretical assumptions. The development of a logic model is iterative in nature, in that it is changed and refined many times as the program develops (Kellogg Foundation, 2000, p. 7)." It allows for a view of the overall program, while specifying program components (Kellogg Foundation, 2000, p. III). "Basically, a logic model is a systematic and visual way to present and share your understanding of the relationships among the resources you have to operate your program, the activities you plan to do, and the changes or results you hope to achieve (Kellogg Foundation, 1998, p.1)." The logic model in this case, served as a draft that was revised as the program evaluation was planned.

First, a program implementation template was developed (see Appendix E) to describe the desired results of the training program. The emphasis of this exercise was to define intended outcomes of the program, both short and long-

term. Particular care was given to identifying the outcomes so that they were specific, measurable, action-oriented, realistic, and timed (Kellogg Foundation, 1998, p. 17). Next, a program planning template for the intended program was laid out (see Appendix F). The function of this worksheet was to highlight the problem that the program intends to address within the context of the community in which it is in. Needs assessment, influential factors, and desired results are addressed. Then, a series of evaluation questions were generated (see Appendix G). For each evaluation focus area, the intended audience, specific questions posed, and how the information would be used was delineated. This exercise assisted in clarifying the purpose of the evaluation. Finally, specific indicators, or data needed to address the question were noted (see Appendix H) for each question posed.

Essentially, for the purposes of this study, emphasis was placed on both the outcomes approach model and the activities approach model as outlined by the Kellogg Foundation (1998). "Outcomes approach models—focus on the early aspects of program planning and attempt to connect the resources and/or activities with the desired results in a workable program. These models subdivide outcomes and impacts that may result from a given set of activities. These are often useful in designing effective evaluation and reporting strategies" (Kellogg Foundation, 1998, p. 10). This type of approach displays the interrelationship between specific program activities and their outcomes. "Activities approach

model—pay the most attention to the implementation process. A logic model of this type links the various planned activities together in a manner that maps the process of program implementation. These models describe what a program intends to do and are most useful for the purposes of program monitoring and management" (Kellogg Foundation, 1998, p. 10). These guidelines were utilized to delineate the necessary steps to follow to implement the program so that the evaluation of its outcomes and implementation would be clear.

Statement of the Problem

ADHD is considered one of the most widely recognized and prevalent childhood disorders impacting the school environment, affecting approximately one student per classroom in the United States (Barkley, 1998). Yet teachers receive insufficient training to meet the specific needs of this population and seemingly have inadequate appropriate knowledge about this disorder (DuPaul & Stoner, 1994: Pfiffner & Barkley, 1998; Reid et al., 1994; Schumm & Vaughn, 1992). Furthermore, teachers have limited confidence in working with these students (Schumm 1994; Schumm & Vaughn, 1992; Sciutto et al., 2000) and their ability to feel as though they can make a positive impact on these students, otherwise known as teacher efficacy, is also likely to be limited (Reid et al., 1994; Tschannen-Moran & Hoy, 2001).

As schools continue to adhere to mainstreaming models of service delivery to enable students with disabilities to be educated with non-disabled

peers to the maximum extent possible, all teachers will become progressively more responsible to meet the needs of students with diverse challenges, including students with ADHD. However, while this gap between teacher knowledge and teacher ability and confidence to meet the needs of students with ADHD exists and perhaps grows, the support of special programming is increasingly sought to provide students with ADHD specialized assistance within the school environment (Forness & Kavale, 2002). This dramatic rise in referral rates for special education services, for example, is diametrically opposed to the larger goal of providing specialized assistance to students within the general education environment. Therefore, it appears warranted to provide educators with training to attempt to increase their knowledge and confidence in order to improve their attitude toward mainstreaming students with ADHD within the general education setting.

The occasional inservice programs that are developed to ameliorate this lack of training about the disorder of ADHD present some shortcomings for practical use (Bos et al., 1997; Kallas et al., 1997; Marchant & Siperstein, 1997; Montague et al., 1997; Worthington et al., 1997). First, some of these programs are developed as part of funded projects and the ensuing training sessions are mainly conducted for the purposes of research within the designated settings, which seemingly limits their accessibility to other school districts. Additionally, the reviewed existing programs require a significant time commitment, ranging

from a full day to several months, which is often not feasible for most educational settings. Essentially, the topic of ADHD is just one of many disorders that requires educator attention and increased training and within the present culture of high-stakes academic testing pressure, school staff are often unable to devote days of training on any one specific topic that ultimately impacts a small percentage of their students. Furthermore, training programs that are commonly designed are unlikely to meet the specific needs of the intended audience within a specific district.

The inservice training program developed by the author, for a large suburban school district, is investigated in terms of outcomes and implementation. Some of the aforementioned concerns are addressed so as to meet the specific needs of the identified consumers. In this study, the impact of this ADHD educator training program is investigated with regard to teacher knowledge, techer perceived confidence, teacher efficacy, teacher attitudes toward mainstreaming, and participant satisfaction with the training is also investigated.

CHAPTER THREE

METHODOLOGY

Participants

The participants were forty-seven elementary school teachers from multiple schools in the Cypress-Fairbanks ISD who voluntarily participated in the inservice course, *ADHD in the Schools: An Educator's Training Program*, during the 2003-2004 school year. Though the training was made available to educators in various professional roles (see Table 1 for breakdown of roles in the district), for research purposes, participants were limited to elementary school teachers.

Participants varied according to gender, age, job role, years of teaching experience, and exposure to ADHD (See Table 2 for participant demographics). As delineated in Table 2, 92% of participants were female, which is not surprising since the training was aimed at elementary school teachers. The average amount of teaching experience was 11 years, ranging from 1 year to 31 years. Forty percent of the participants fell in the 41-50 year-old age group. Regarding job role, 55% of participants were regular education teachers and the remaining 45% were special education teachers. Regarding grade level that they teach, the majority of the respondents (42.6%) noted that they taught across grade levels.

Table 1

Partial Listing of the Staff of Cypress-Fairbanks ISD

Position	Number
Principals and Assistant Principals	230
Directors of Instruction	20
Classroom Teachers	4,421
Special Education Teachers	710
Deaf Education Teachers	25
Classroom Aides	673
Special Education/Deaf Education Aides	599
Counselors, Psychologists, Attendance Officers, Visiting Teachers	195
Special Education Diagnosticians, Supervisors, Counselors, Curriculum	97
School Nurses	66

Note. Adapted from 2003-2004 *Profile: An Overview of Cypress-Fairbanks Independent School District*, p. 12.

Table 2
Participant Demographics

Category	Responses	N	% of Sample
Gender	Male	4	8.5
	Female	43	91.5
Age	18-20	0	0
	21-30	11	23.4
	31-40	7	14.9
	41-50	19	40.4
	51+	10	21.3
Current grade	Pre-K, PPCD, Kindergarten	3	6.4
	1	2	4.3
	2	6	12.8
	3	5	10.6
	4	7	14.9
	5	4	8.5
	Across grade levels	20	42.6
Job Role	Regular Education Teacher	26	55.3
	Special Education Teacher	21	44.7
Learned about ADHD in an educator preparation program	No	18	38.3
	1-3 hour presentation	15	31.9
	More than one 1-3 hour presentation in course	14	29.8
How many previous hours of training since training program	0	14	29.8
	1-3	8	17.0
	4-8	14	29.8
	9-12	6	12.8
	13 or more	5	10.6
Number of students taught with suspected/diagnosed ADHD	0	2	4.3
	1-5	10	21.3
	6-10	9	19.1
	11-15	4	8.5
	16-20	1	2.1
	21 or more	21	44.7

Participants varied with regard to prior knowledge about, and exposure to, ADHD. Seventy percent of respondents indicated that they had received less than three hours of training on ADHD while in their training program. Once in the workforce, 30% indicated that they had received no training on ADHD and an alarming 77% indicated that they had received less than eight hours of training on ADHD prior the current inservice course. Yet, 44% of respondents indicated that they had taught 21 or more students with suspected and/or diagnosed ADHD.

The Cypress-Fairbanks ISD, in which the study was conducted, serves 74,736 students, 7,100 of whom are identified as students with disabilities. As the second largest school district in the county, it encompasses over 250 neighborhood subdivisions in the Houston area and is comprised of 61 schools (see Table 3 for breakdown). The district earned distinction as a Texas "Recognized" School District during the 1999-2000, 2000-01, 2001-02, 2002-03 school years. There are 5,156 members of the teaching staff at Cypress-Fairbanks ISD. The average length of experience is 11 years. Bachelor's degrees are held by 76.9%, Master's degrees are held by 22.7%, and Doctoral degrees are held by 0.40% of the staff.

Table 3

Number of Schools and Students in the Cypress-Fairbanks ISD

	Number of schools	Number of students
High Schools	8	21,281
Middle Schools	12	17,225
Elementary Schools	38	36,138
Special Assignment	3	92
Total	61	74,736

Note. Adapted from 2003-2004 *Profile: An overview of Cypress-Fairbanks Independent School District*, p. 11.

Procedure

Prior to beginning this study, the Departmental Review Committee and the University of Texas Institutional Review Board were petitioned to request permission to proceed. Additionally, the Cypress Fairbanks ISD research department was petitioned for permission to conduct the proposed training with school staff. All requirements and procedures set forth by these committees were met. Additionally, written participant consent was secured from individuals who attended the designated *ADHD in the Schools* training sessions and chose to participate in the proposed study (see Appendix I).

Many schools in the Cypress Fairbanks ISD have and will continue to be presenting the *ADHD in the Schools: An Educator's Training Program* to their staff, though it is not mandated. Prior to the launching of the training, which occurred during the 2000-01 school year, meetings with members of the Department of Psychological Services were held, as the psychological services staff members are the designated contact personnel for the implementation of this program for each campus in the district.

Independent of this study, each campus psychological services staff person met with the principals or other administrators of their schools in order to set-up mutually convenient training sessions utilizing the *ADHD in the Schools* training materials. Additionally, decisions regarding format and length of the training have been made and continue to be, as each school is at liberty to use the training

materials in a manner that they best see fit. Each psychologist may choose to facilitate or co-facilitate the training session at their schools.

With regard to the current research study, the ADHD inservice training program was submitted for inclusion in the district-wide staff development program and was advertised to elementary school teachers via the on-line registration system, rather than presented at individual campuses as described above. Interested participants who registered from various elementary schools, gathered at a central location on the specified dates and times. The researcher conducted each of the three training sessions for this study.

Once participants registered to attend the training and arrived at the scheduled location, two copies of the consent form were distributed to each participant to assist them in making a decision to choose to participate or decline to participate in the research study prior to the beginning of the training session. Consent forms were read aloud by the researcher to the potential participants and reviewed with group. Those agreeing to participate were instructed to sign and turn in one copy and to retain the second copy for their reference. Teachers who attended the training, but chose not to participate in the research study, had supplemental materials relating to ADHD available to them to peruse while research participants complete measures.

Upon receipt of the aforementioned consent forms, at the beginning of each of the inservice training sessions, measures were distributed to participants

in two packets. Packet 1 contained the pretest measures and Packet 2, which was coded to correspond to Packet 1 and attached with a rubber band, contained the posttest measures. All information collected was anonymous. As a group, participants were instructed to open Packet 1 and ensure that the same code pre-printed code number was on each measure. Participants were asked to complete the following measures from Packet 1, prior to the beginning of training session: Demographic Information Form, Educator ADHD Knowledge Form, Perceived Confidence in Working with Students with ADHD measure, the Teacher Efficacy Scale, and the Teachers' Attitudes Toward Mainstreaming Students with ADHD measure independently. Ample time was provided for each participant to complete the measures.

Upon completion of the aforementioned measures, participants were instructed to return the materials to the Packet 1 envelope and the *ADHD in the Schools* training session began. At the end of the 2-hour training session, participants were asked to open Packet 2 and were instructed to complete the following measures: Educator ADHD Knowledge Form, Perceived Confidence in Working with Students with ADHD, Teacher Attitudes Toward Mainstreaming Students with ADHD, Teacher Efficacy Scale, and the Participant Satisfaction Form. Upon completion of these measures, participants again were instructed to return the measures to the Packet 2 envelope and to turn both packets into facilitator prior to exiting. Unrelated to the study, the participants were each

asked to completed district generated attendance and feedback forms to receive district credit for participation in the staff development class.

ADHD in the Schools Program

Program Purpose

In an attempt to address the educational needs of students with ADHD via educating teachers, administrators, paraprofessionals, and other school staff, the Cypress-Fairbanks ISD in Houston, Texas, contracted the author for the development of an educator inservice training program on ADHD. Originating from the overarching concern that a disproportionate number of students were identified as in need of special education services for ADHD, under the disability category of OHI, as well as, concerns from parents that teachers were not well-prepared to meet the needs of their children with ADHD, the Assistant Superintendent of Student Support Services of the Cypress-Fairbanks ISD suggested and supported the development of this district-wide training program. A proposal was created by the author and was ultimately selected to be developed for use by the district.

The purpose of this project from the district's perspective was to prepare a comprehensive inservice education program for school staff based on the current research literature. The goal of the training is to increase educator knowledge and confidence about the disorder, intervention methods, and the school district's procedures regarding working with students with ADHD. Implementation of the

training began during the 2001-2002 school year with plans to continue training and revision in subsequent years.

Program Development

Planning meetings were held during which the needs of the district were discussed against the background of current research. Preliminary planning simultaneously occurred with the Director of Psychological Services, as his staff would comprise the primary professionals responsible for overseeing the delivery of the program. Over a six month period, the program was developed, based on the content of similar researched programs (see Appendix D for the Table of Contents of the *ADHD in the Schools* training program). During that period, numerous revisions were made based on input from district personnel from various departments including: psychologists, counselors, nurses, diagnosticians, a Director of Instruction, the Director of Elementary Counselors, the Director of Speech Pathologists, the Director of Special Education, the Director of Psychological Services, and the Assistant Superintendent of Student Support Services. Once in the final stages, an overview of the program was presented at multiple department meetings and to a parent advisory committee for feedback. Revisions were made to address the feedback received from the diverse groups.

Conceptualized as a training module to which additional training sessions can later be added, the program was developed to be approximately two hours in length in order to justify it being presented to the majority of the district, while

being cognizant of participants' limited time. After some deliberation, it was ultimately decided that the same program would be developed and delivered to all the schools regardless of grade level. This decision created the challenge of creating relevant content that would bridge issues from pre-kindergarten through high school with regard to ADHD. Similarly, it was aimed at all educators, including regular and special education teachers, administrators, counselors, and paraprofessionals, which posed the challenge of balancing the instructional level of the content so that it would not be overly simplistic to those with some familiarity yet not too theoretical and impractical for those with limited knowledge.

Program Components

ADHD in the Schools: An Educator's Training Program is comprised of five main components (see Table 4). The *Facilitator's Guide* is designed to be used by school staff that would be responsible for the implementation of the program. This manual provides all the needed information required to present the training, as well as information about how to customize the training for specific audiences. The *Overhead Transparencies* are full-color graphical images intended to clarify the content presented. The *Participant Guide* is provided to each educator involved in the training as a handout of the content and activities presented. The *Intervention Guide* is also provided to each participant as a tool to use during the training, as well as a resource for later reference. A *Behavior*

Templates Computer Disk is provided as a guide for school staff that includes behavior contract samples and directions for their use and modification. Finally, as a related effort, materials such as recent journal articles, membership information on support groups, and other useful information for educators and parents were updated and compiled for the *ADHD Resource Box* that already in existed on each campus, but was outdated and under-utilized.

Program Objectives

Five main objectives of the training program are delineated for the participants: 1) be able to identify characteristics of ADHD, 2) know the educator's role in assessment of ADHD and intervention procedures in the Cypress-Fairbanks ISD, 3) be familiar with treatment options for managing ADHD, 4) be able to select and develop interventions for the school or classroom based on characteristics of students with ADHD, and 5) be aware of resources for students with ADHD.

Format of the Training Sessions

Training sessions for this study were three hours in length to allow sufficient time to complete measures as well as to conduct the two-hour *ADHD in the Schools* training program. The same facilitator, the author, conducted each of the training sessions and the same content was covered during each session (see Appendix D for Table of Contents from the *ADHD in the Schools* training

program). Refreshments were served and a break was provided for the comfort of the participants.

The *ADHD in the Schools* developed materials were used for the session presentation. The first part of the training session is mainly didactic learning. Visual aids in the form of overhead transparencies, charts, diagrams, and handouts are provided to aid in the learning of the information. Examples from school experiences are provided as is the opportunity for brief comments and questions along the way. Participants are encouraged to actively participate, as there are opportunities for them to highlight characteristics of an individual they have known with ADHD and for the group to reach consensus on which of the mentioned characteristics are the most common, not reflective of the majority of cases, or most difficult to deal with in the schools. During the discussion on comorbid conditions, participants are asked to conjure up a memory of a second individual with ADHD and to highlight any differences from previous examples. The discussion of related difficulties follows.

Following the brief break, the remainder of the training session is a group learning format. Participants are divided into small groups and are first asked to respond to a vignette aimed at encouraging the participants, in a collaborative way, to discuss and problem-solve how to get assistance for students with ADHD in the district in which they work. During this time, the facilitator circulates among the group, highlighting concerns, asking participants to provide

clarification to their ideas, presenting alternative scenarios, et cetera to encourage the group into further discussion and more detailed problem-solving. Volunteers then share their group's analysis with the larger group which will lead to the presentation of the accepted procedure delineated in the district. Another group activity follows in which the participants are again asked to form small groups to address a typical behavior problem experienced by students with ADHD in the schools. They are encouraged to brainstorm intervention possibilities to the presented difficulty and then are given an additional resource, *The Intervention Guide*, to assist them in developing alternatives to managing the problem in the example given. Discussion ensues and is followed by a closing that highlights available resources in the district and surrounding community.

Table 4

Description of the Components of ADHD in the School Program

Component	Description
Facilitator Guide	This 100 page script is the core of the training program and aims to assist the facilitator in presenting the most current information about ADHD.
Overhead Transparencies	The 38 full-color overhead transparencies that accompany the *Facilitator Guide* are intended to serve as visual aids in the learning of the concepts presented.
Participant Guide	This packet of materials is distributed to participants as supporting documentation for following along during the presentation and taking notes.

Table 4 (*continued)*

Description of the Components of ADHD in the Schools: An Educator's Training Program

Component	Description
Intervention Guide	This booklet is a compilation of strategies aimed at assisting educators in managing ADHD behaviors in the school and classroom. It is organized based on DSM-IV criteria of ADHD. It is also distributed to program participants.
Behavior Templates Computer Disk	This disk includes templates for behavior contracts (and explanations for their use), which can be easily modified to suit individual needs. It will be kept in the *ADHD Resource Box* for utilization by school personnel.

Instruments

Demographic Information Form

The purpose of this checklist is to solicit information from the participants to discern ways in which they may differ. Respondents are asked to either check a box or in some cases, to write something in a blank. Questions on this form yield information regarding the following areas: gender, age, teaching grade level, job role, and years of teaching experience. Other questions on this form elicit information about prior exposure to ADHD by requesting information about: extent of ADHD training received in educator preparation program, number of hours of inservice training received on ADHD, and approximate number of students taught with ADHD (see Appendix J). This information was used to describe the participants.

Educator ADHD Knowledge Form

A 23 item multiple-choice measure was developed by the author to assess teacher knowledge about ADHD (see Appendix K). Each item of this measure consists of a question or statement followed by one correct response and four distracters. Scoring of this measure is that each item correct is equal to one point (see Appendix L for scoring key).

The items were derived from the training program content and reflect the emphasis on each topic area from the training program. A test blueprint was devised to ensure that items well reflected both the content of the program and a

mixture of both recall and understanding levels of knowledge (see Haladyna, 1997). Other instruments were reviewed during the development phase (e.g., ADD Knowledge Assessment, Nahmias et al., 1997; Knowledge of Attention Deficit Disorder Scales (KADDS), Sciutto et al., 2000). The multiple-choice format was chosen as the often used true-false format has been shown to lend itself to difficulties as participants would have a 50% chance of responding correctly merely by guessing (Sciutto et al., 2000). A concentrated effort was made to include items that tapped into knowledge beyond the obvious symptoms of ADHD, as research has demonstrate that teachers appear to have a limited amount of information about etiology, developmental course, and treatment of ADHD (Pfiffner & Barkley, 1990).

In the development phase, the test was administered to 10 doctoral level psychologists working in the Cypress-Fairbanks school district for feedback. Adjustments, as needed, were made to clarify items and responses.

Based on collected pilot data, an instrument reliability index was determined by utilizing the Kuder-Richardson 20 formula. Utilizing 133 participant responses on the posttest version of the knowledge measure, the reliability index for the Educator ADHD Knowledge Form was .65. As a result of item analysis, several items from this measure reflected low correlations with the overall test reliability (i.e., items 6, 9, 14, 23). When the reliability was recalculated with these items eliminated, the reliability index increased to .71.

This revised version was used for the present study resulting in a 23 item multiple choice measure. Based on results from the current study of 47 participants, the internal consistency reliability for the Educator ADHD Knowledge measure was .65.

Perceived Confidence in Working with Students with ADHD

The Perceived Confidence in Working with Students with ADHD measure (see Appendix M) was developed by Reid, Vasa, Maag, and Wright (1994). The measure is comprised of 10 items that assess "participants' confidence in their ability to accomplish instructional tasks necessary for successful classroom integration of students with ADHD" (Reid et al., 1994, p. 197). Participants rate their confidence in performing each activity on a Likert scale of (1) no confidence to (5) strong confidence. The authors stated that the items were derived from research that suggested that these functions, among others, were necessary for teachers to work with students with disabilities in a mainstream setting.

According to the authors, factor analysis using an oblimin rotation indicated a two factor solution. Factor 1 consisted of items 2 through 10 and Factor 2 consisted of item 1. Reliability results using Cronbach's alpha was .82 (Reid et al., 1997).

For this study, only minor changes were made to this instrument. In addition to formatting changes to improve readability, descriptors were given to each of the Likert scale scores to clarify what each number represented.

Upon completion of the data collection in this study, the internal consistency reliability for the Perceived Confidence in Working with Students with ADHD measure was .90.

Teachers' Attitudes Toward Mainstreaming Students with ADHD

This six question attitude measure was adopted from the work of Bender and Vail (1995). The original measure served to evaluate teacher's attitudes toward mainstreaming students in general, and was later used to better understand teachers' views with students with learning disabilities. Each question assesses a teacher's belief about the positive effects of mainstreaming and is rated on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). The item responses are totaled to generate a composite score. A higher score indicates a more positive attitude regarding the benefits of mainstreaming for students with and without disabilities.

Reliability was established by the authors from among 40 experienced teachers enrolled in graduate courses, in a test-retest reliability format over a 2-week period. The total test-retest reliability correlation was r=.81, p<.0001 (Bender & Vail, 1995).

For the purposes of this study, this measure was modified (see Appendix N). Items were changed to specifically ask about mainstreaming for students with ADHD rather than mainstreaming in general. Additional items were added to increase the length of the test so as to increase reliability. To increase clarity,

descriptors were added to each of the numerical ratings from 1 to 5. Furthermore, the word "handicapped" was replaced with the more widely acceptable term, "disabled." Upon completion of the data collection, the internal consistency reliability was calculated and found to be .85.

Teacher Efficacy Scale

Gibson and Dembo's Teacher Efficacy Scale (TES) has been recognized as standard measures of efficacy (Gibson & Dembo, 1984; Ross, 1994). The TES consists of 16 Likert-type items rated from (1) strongly disagree to (6) strongly agree (Gibson & Dembo, 1994; Henson et al., 2001). This scale yields two subscales, personal teaching efficacy and general teaching efficacy. However, this scale has undergone multiple revisions. One study found that the personal teaching efficacy subscale of the TES maintains stronger score integrity than the general teaching efficacy subscale of the instrument (Henson et al., 2001). Other research has found that although personal efficacy clearly emerged as a factor on the TES, the general efficacy factor, so often cited, was not as clear (Coladarci & Breton, 1997). Additionally, research cited earlier indicates that personal teaching efficacy is a more salient factor with regard to teachers' willingness to work with students with special needs.

Therefore, for this study a shortened version of the Teacher Efficacy Scale will be used that consists of items referring to the personal teaching efficacy dimension (and not general teaching efficacy). This scale, developed by Meijer

and Foster (1988), is comprised of 11 items that are rated on a four-point Likert scale (see Appendix O). Scores were compiled for a total efficacy score with lower scores represent higher levels of efficacy. It is important to note that some items required reverse scoring as some items were worded positively and other were worded negatively. Reliability of this scale was determined to be .63 in a previous study (Meijer & Foster, 1988). Some language was slightly modified for the proposed study, (i.e. the word "pupils" was replaced with "students" and the word "large" was replaced with "significant"). Upon completion of the data collection for the present study, the internal consistency reliability was calculated and it was found to be .77.

Participant Satisfaction Form

On this measure, participants were asked to provide feedback about their satisfaction with the program (see Appendix P). Part A asks participants to rate the extent to which the training met previously identified district needs on a Likert scale from (1) not at all to (5) extremely well. The items in Part A were developed from needs assessment data that was collected from previous ADHD training sessions with elementary, middle school, and high school educators across the district. Participants were asked to respond to the following question, "From the onset, please indicate what you hope to learn from today's session." Responses from educators across various schools were compiled and categorized into emerging topic areas. There were 331 comments in total. Most responses fit

clearly into one of eight topic areas though an "other" category was created for those that did not clearly fit into one of the created categories (see Figure 1). Within each category, comments were further categorized into subtopics of interest which are now reflected in Part A of this measure.

Part B contains specific questions that solicit information about the overall program, content of the presentation, and presentation style and yield ratings on a Likert scale from (1) unsatisfactory to (5) very good. Space is provided for participants to explain their rating within each item. Participants were also asked to suggest program improvements and if they would recommend the training to others.

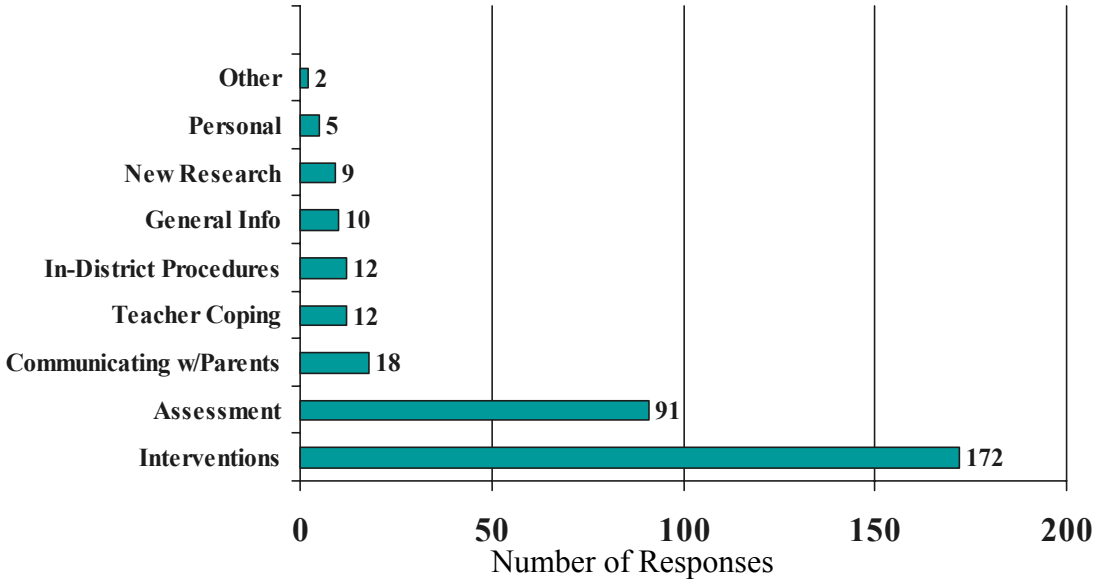


Figure 1. Needs Assessment Results from 331 responses from educators in the Cypress-Fairbanks, ISD.

Research Questions and Hypotheses

Questions Regarding Outcomes

Research Question 1 : Will the training program, *ADHD in the Schools,* improve teacher knowledge about ADHD?

Hypothesis 1: Teacher knowledge of ADHD will increase as a result of participation in the *ADHD in the Schools* training program.

Rationale: Studies have demonstrated that inservice programs have successfully increased teacher knowledge about ADHD (Bos et al., 1997; Kallas et al., 1997; Marchant & Siperstein, 1997; Montague et al., 1997; Worthington et al., 1997). Though the previously researched programs are much longer in duration than the proposed training program, it is expected that this training will impart sufficient new information to increase teacher knowledge about ADHD. Additionally, pilot data results from 133 participants, including teachers, paraprofessionals and administrators revealed a strong, significant result for knowledge gain from pretest to posttest ($p<.001$) as a result of inservice training on a previous version of the knowledge measure.

Data Analysis: A repeated measures one-way ANOVA will be conducted to test for overall significance of the treatment by comparing mean teacher pretest scores on the Educator ADHD Knowledge Form with mean teacher posttest scores. An alpha level of $p<.05$ will be utilized.

Research Question 2: Will the training program, *ADHD in the Schools*, increase teacher perceived confidence in working with students with ADHD?

Hypothesis 2: Teacher perceived confidence in working with students with ADHD will increase as a result of the *ADHD in the Schools* training program

Rationale: Research has demonstrated that teacher confidence in working with students with ADHD is positively related to teacher knowledge of ADHD (Sciutto et al., 2000). Since new knowledge about ADHD will be presented to teachers as part of the inservice training program, it is likely that teacher confidence will also increase.

Data Analysis: A repeated measures one-way ANOVA will be conducted to test for overall significance of the treatment by comparing mean teacher pretest scores on the Perceived Confidence in Working with Students with ADHD measure with mean teacher posttest scores on this measure. An alpha level of $p<.05$ will be utilized.

Research Question 3: Will the training program, *ADHD in the Schools*, improve teachers' attitudes toward mainstreaming students with ADHD?

Hypothesis 3: Teachers' attitudes regarding mainstreaming students with ADHD will improve as a result of the *ADHD in the Schools* training program.

Rationale: Over one-third of teachers studied demonstrated lack of support for mainstreaming (Bender & Vail, 1995). However, mainstreaming attitudes were positively correlated with the number of classes taken on teaching students with special needs. Essentially, teachers who had more coursework regarding the education of students with disabilities demonstrated more favorable attitudes toward mainstreaming. Additional research with students with learning disabilities suggested that mainstreaming of these students was related to inservice teacher education on addressing individual differences (Schumm et al., 1994). Research has not investigated teachers' attitudes with regard to mainstreaming students with ADHD, in particular. In this study, teachers will gain additional training about students ADHD and will therefore be likely to demonstrate more favorable attitudes about mainstreaming students with ADHD.

Data Analysis: A repeated measures one-way ANOVA will be conducted to test for overall significance of the treatment by comparing mean teacher pretest scores on the Attitudes Toward Mainstreaming measure with mean teacher posttest scores on this measure. An alpha level of $p<.05$ will be utilized.

Questions Regarding Theoretical Linkages

Research Question 4: Is teacher efficacy related to teacher perceived confidence in working with students with ADHD?

Hypothesis 4: Teacher efficacy will be significantly correlated to teachers' perceived confidence in working with students with ADHD.

Rationale: Teachers high in efficacy have been described as having confidence (Wheatley, 2002), though it is not clear if this concept has been empirically researched with specific regard to working with students with ADHD.

Data Analysis: A Pearson correlation will be utilized to correlate the mean pretest scores on the Teacher Efficacy Scale with posttest scores on the Perceived Confidence in Working with Students with ADHD measure.

Research Question 5: Is teacher efficacy related to teachers' attitudes toward mainstreaming students with ADHD?

Hypothesis 5: Teacher efficacy will be significantly correlated to teacher attitudes toward mainstreaming.

Rationale: Previous research has demonstrated that teachers with less positive attitudes about their own effectiveness (i.e., self-efficacy) utilize effective instructional techniques less frequently (Bender & Vail, 1995). Research has also shown that teachers with a higher sense of efficacy are likely to engage in more effective instructional interventions (Brownell &

Pajares, 1996), work longer with a student who is struggling (Gibson & Dembo, 1984), and are less likely to refer a difficult student for special education services (Meijer & Foster, 1988; Podell & Soodak, 1993; Soodak & Podell, 1993).

Data Analysis: A Pearson correlation will be utilized to correlate the mean pretest scores on the Teacher Efficacy Scale with posttest scores on the Teacher Attitudes Toward Mainstreaming measure.

Research Question 6: Is teacher efficacy related to teacher knowledge about ADHD?

Hypothesis 6: Teacher efficacy will be significantly correlated to knowledge of ADHD.

Rationale: In two studies, knowledge of ADHD was found to be positively related to teacher's confidence in their ability to teach and make accommodations for students with ADHD (Sciutto et al., 2000; Reid et al., 1994). However it is not clear if confidence is a synonymous construct to efficacy, therefore it warrants further investigation.

Data Analysis: A Pearson correlation will be utilized to correlate the mean pretest scores on the Teacher Efficacy Scale with posttest scores on the Educator ADHD Knowledge Form.

Research Question 7: Is teacher perceived confidence in working with students with ADHD related to teacher attitudes toward mainstreaming students with ADHD?

Hypothesis 7: Perceived confidence in working with students with ADHD is positively correlated to teacher attitudes toward mainstreaming students with ADHD.

Rationale: Research has demonstrated that teachers lacking knowledge, skills, and confidence (Schumm & Vaughn, 1992; 1995; Schumm, Vaughn, Gordon, & Rothlein, 1974) are not willing to have students with disabilities in their classrooms (Whinnery et al., 1991). Therefore it is likely that this also holds true for students with ADHD.

Data Analysis: A Pearson correlation will be utilized to correlate the mean posttest scores on the Perceived Confidence in Working with Students with ADHD measure with the posttest scores of the Teachers' Attitudes Toward Mainstreaming Students with ADHD measure.

Research Question 8: Is teacher knowledge about ADHD related to teacher perceived confidence in working with students with ADHD?

Hypothesis 8: Teacher knowledge about ADHD will be positively correlated with teacher perceived confidence in working with students with ADHD.

Rationale: In a study, researchers found that overall teacher knowledge of ADHD was positively related to confidence in their ability to effectively teach a child with ADHD (Sciutto et al., 2000). An additional study demonstrated that teachers trained about ADHD reported higher perceived confidence in the ability to work with these students (Reid et al., 1994). Essentially, these studies demonstrate a potential link between teacher knowledge and confidence in working with students with ADHD.

Data Analysis: A Pearson correlation will be utilized to correlate the mean posttest scores on the Perceived Confidence in Working with Students with ADHD measure with the mean posttest scores on the Educator ADHD Knowledge Form.

Questions Regarding Participant Satisfaction

Research Question 9: To what extent will the program, *ADHD in the Schools*, address the identified needs of the teachers in this district?

Hypothesis 9: The *ADHD in the Schools* training program will likely well meet the identified needs of the teachers.

Rationale: As the development of this training program for the intended audience was quite iterative in nature during the development phase, it is likely that it will well meet the needs of the participants. Additionally, formal and informal needs assessment data was previously gathered on a

sample of teachers and it appears that the training program will likely address the topics that they previously identified as needs.

Data Analysis: Part A of the Participant Satisfaction measure will yield mean scores for each area as previously indicated as needs by educators in the intended district. Mean scores will be ranked to determine the participants' satisfaction with coverage of each area.

Research Question 10: How well do participants rate the *ADHD in the Schools* Training Program?

Hypothesis 10: No specific hypotheses are indicated as the research question is exploratory.

Data Analysis: Teacher ratings on Part B of the Participant Satisfaction Measure will yield mean scores regarding overall training, content, and presentation style, as well as qualitative data regarding satisfaction with the *ADHD in the Schools* training program.

CHAPTER FOUR

RESULTS

This study explored the implementation and outcomes of an inservice training program on ADHD aimed at teachers. First, the study hypotheses addressing outcomes will be reviewed followed by hypotheses regarding theoretical linkages. Finally, results regarding participant satisfaction with the ADHD inservice training program will be discussed. As an overview, Table 5 below presents descriptive statistics across all measures utilized. Table 6 displays the correlations among all the measures.

Table 5

Descriptive Statistics of All Measures

Measure	Pretest Total Score		Posttest Total Score		Possible Range
	M	SD	M	SD	
Educator ADHD Knowledge Form	13.38	3.57	17.74	3.46	0-23
Teacher Perceived Confidence in Working with Students with ADHD	37.00	6.63	39.53	6.33	10-50
Teacher Attitudes Toward Mainstreaming Students with ADHD	41.98	5.98	42.51	6.33	11-55
Teacher Efficacy Scale	23.07	3.89	23.00	5.10	11-44
Participant Satisfaction Scale: Part A	--	--	93.47	14.40	23-115

Table 6

Correlations of all Measures

	Pre Know	Pre Conf	Pre Att	Pre Effic	Post Satis	Post Know	Post Conf	Post Att	Post Effic
Pretest Knowledge	1	.22	.29*	-.25	.10	.73**	.06	-.09	.10
Pretest Confidence		1	.29	-.64**	.30*	.19	.76**	.16	-.31*
Pretest Attitude			1	-.23	.10	.28	.41*	.47**	.04
Pretest Efficacy				1	-.17	-.16	-.40**	.12	.31*
Posttest Satisfaction					1	.11	.30*	.07	-.18
Posttest Knowledge						1	.03	-.05	-.04
Posttest Confidence							1	.39**	-.24
Posttest Attitude								1	-.44**
Posttest Efficacy									1

*=p<.05; **= p<.01

Outcomes

The first set of research questions set out to determine if the developed teacher training program on ADHD would be able to impact teachers in a positive way. Specifically, questions were posed about teacher knowledge about ADHD, teacher perceived confidence in working with students with ADHD, and teacher

attitudes toward mainstreaming students with ADHD. Though no specific hypotheses were set forth with regard to outcomes of efficacy, the assessment of teacher efficacy will also be briefly addressed here in order to clarify findings with regard to subsequent analyses involving efficacy.

Hypothesis 1: Teacher knowledge of ADHD will increase as a result of participation in the *ADHD in the Schools* training program.

It was expected that teachers would gain knowledge about ADHD as a result of participating in the developed training program. A repeated-measures one-way ANOVA was conducted to test for overall significance of the treatment by comparing mean teacher pretest scores on the Educator ADHD Knowledge Form with mean teacher posttest scores on the same measure. As predicted, the results of the repeated-measures ANOVA indicated that there was a significant increase in knowledge from pretest to posttest, $F(1, 46)=135.81$, $p<.001$. Table 7 presents the descriptive statistics.

Table 7

Descriptive Statistics of Educator ADHD Knowledge Form

	Mean	SD	N	Possible Range
Pretest Total ADHD Knowledge Score	13.38	3.57	47	0-23
Posttest Total ADHD Knowledge Score	17.74	3.46	47	0-23

Hypothesis 2: Teacher perceived confidence in working with students with ADHD will increase as a result of the *ADHD in the Schools* training program.

It was predicted that teachers' perceived confidence in working with students with ADHD would increase as a result of the training. A repeated-measures one-way ANOVA was conducted to test for overall significance of the treatment by comparing mean teacher pretest scores on the Perceived Confidence in Working with Students with ADHD measure with mean teacher posttest scores on this measure. As hypothesized, the results of the repeated-measures ANOVA indicated that there was a significant increase in perceived confidence in working with students with ADHD from pretest to posttest, F (1, 46)=150.65, p<.001. Table 8 presents the descriptive statistics.

Table 8

Descriptive Statistics of Perceived Confidence in Working with Students with ADHD measure

	Mean	SD	N	Possible Range
Pretest Total Confidence Score	37.00	6.63	47	10-50
Posttest Total Confidence Score	39.53	6.33	47	10-50

Hypothesis 3: Teachers' attitudes regarding mainstreaming students with ADHD will improve as a result of the *ADHD in the Schools* training program.

It was hypothesized that teachers' attitudes toward mainstreaming students with ADHD would improve as a result of the training program. A repeated-measures one-way ANOVA was conducted to test for overall significance of the treatment by comparing mean teacher pretest scores on the Teachers' Attitudes Toward Mainstreaming Students with ADHD measure with mean teacher posttest scores on this measure. Results did not support this hypothesis as results were not found to be significant $F(1, 46) = .329$, $p = .569$. Table 9 displays the descriptive statistics.

Table 9

Descriptive Statistics of Teachers' Attitudes Toward Mainstreaming Students with ADHD measure

	Mean	SD	N	Possible Range
Pretest Total Attitude Score	41.98	5.98	47	11-55
Posttest Total Attitude Score	42.51	6.33	47	11-55

Efficacy:

Though no specific hypotheses for changes in efficacy as a result of the inservice training were proposed, results demonstrate that efficacy remained quite stable from pretest (*Mean*=23.07, *SD*=3.89) to posttest (*Mean*=23.00, *SD*=5.10), as expected (see Table 10).

Table 10

Descriptive Statistics of Teacher Efficacy Scale

	Mean	SD	N	Possible Range
Pretest Total Efficacy Score	23.07	3.89	47	11-44
Posttest Total Efficacy Score	23.00	5.10	47	11-44

Theoretical Linkages

The second set of research questions was posed to investigate the potential relationships among the aforementioned constructs. Teacher efficacy is considered first, in relationship to each of the following: teacher perceived confidence in working with students with ADHD, teacher attitudes toward mainstreaming students with ADHD, and teacher knowledge about ADHD. Subsequently, teacher perceived confidence is discussed with regard to teacher attitudes toward mainstreaming students with ADHD, and teacher knowledge about ADHD. Results are presented below.

Hypothesis 4: Teacher efficacy will be significantly correlated to teachers' perceived confidence in working with students with ADHD.

Though not previously established, it was hypothesized that teachers high in efficacy would also demonstrate high perceived confidence in working with students with ADHD. A Pearson correlation was calculated to correlate the mean

pretest scores on the Teacher Efficacy Scale with posttest scores on the Perceived Confidence in Working with Students with ADHD measure. As predicted, a significant correlation was found, thereby supporting the predicted hypotheses (r=-.40, p<.01). It is important to note that the correlation is negative because on this measure a high score means low efficacy.

Hypothesis 5: Teacher efficacy will be significantly correlated to teacher attitudes toward mainstreaming.

It was predicted that teacher efficacy would be significantly correlated to teacher attitudes toward mainstreaming students with ADHD. This hypotheses was not supported as the results were not significant (r=.12, p=.434) when tested as proposed, by comparing pretest scores on the Teacher Efficacy Scale with the posttest score on the Teacher Attitudes Toward Mainstreaming Students with ADHD measure.

Hypothesis 6: Teacher efficacy will be significantly correlated to knowledge of ADHD.

It was hypothesized that teacher efficacy would be significantly correlated to teacher knowledge of ADHD. Results do not support the hypothesis as the correlation was non-significant (r=-.16, p=.288).

Hypothesis 7: Perceived confidence in working with students with ADHD will be positively correlated to teacher attitudes toward mainstreaming students with ADHD.

It was predicted that teacher perceived confidence in working with students with ADHD would be positively correlated to teacher attitudes toward mainstreaming students with ADHD. Results are reflective of positive correlation, supporting the hypothesis (r=.39, p=.006).

Hypothesis 8: Teacher knowledge about ADHD will be positively correlated with teacher perceived confidence in working with students with ADHD.

It was hypothesized that teacher knowledge about ADHD would be positively correlated with teacher perceived confidence in working with students with ADHD. Results were not supportive of the hypothesis as the correlation was non-significant (r=.03, p=.820).

Participant Satisfaction

As the ADHD inservice training program presented in this study was developed with the needs of the participants and district in mind, participant satisfaction with the program was assessed to guide future use of this program or inform the development and use of other similar inservice training programs on ADHD. The final research question was exploratory in nature.

Research Question 9: To what extent will the program, *ADHD in the Schools*, address the identified needs of the teachers in this district?

It was hypothesized that the *ADHD in the Schools* training program would meet the identified needs of the teachers well. During a needs assessment, teachers identified areas that they were interested in learning more concerning

ADHD. Teacher comments were compiled and resulted in 23 areas that are reflected on Part A of the Participant Satisfaction Form. Results are presented in Table 11, in order of satisfaction. Overall satisfaction was rated high (*M*=93.47 (out of a possible total of 115), *SD*=14.41). Ratings on individual items demonstrate that the background discussion on characteristics, causes, prevalence, developmental course, and ways to recognize met the participants' needs best. Information presented on communicating with parents and increased understanding of the role, support and referral process within the school district were also rated as meeting their needs "very well." Slightly lower ratings were given to the discussion on specific intervention strategies (falling between "enough" and "very well"), with the exception of medication, which was rated between "very well" and "extremely well" in meeting participants' needs.

Table 11

Descriptive Statistics of Participant Satisfaction measure: Part A

	Mean	SD	Max	Min	N
Characteristics of ADHD	4.49	.51	4	5	47
Causes of ADHD	4.43	.68	3	5	47
Prevalence of ADHD	4.43	.65	3	5	47
Medication	4.43	.69	2	5	47
Ways to recognize ADHD	4.40	.54	3	5	47
New research about ADHD	4.35	.77	2	5	47
General information	4.34	.79	2	5	47
Boundaries as school representative	4.21	.83	2	5	47
Awareness of district support	4.13	.86	2	5	47
Awareness of referral process	4.02	.79	2	5	47
Collaborating with parents	4.00	.73	2	5	47
Strategies to increase motivation	3.96	.91	2	5	47
Strategies to improve classroom behavior	3.96	.86	2	5	47
Strategies to increase attention/focus	3.93	.80	3	5	47
Strategies to improve organization	3.91	.91	2	5	47
Strategies to increase work productivity	3.89	.84	2	5	47
Strategies to teach self-management	3.89	.84	2	5	47

	Mean	SD	Max	Min	N
Strategies to improve discipline	3.87	.92	2	5	47
Improving teachers' coping	3.87	.97	1	5	47
Strategies to improve social skills	3.85	.88	2	5	47
Managing family issues with ADHD	3.62	1.05	1	5	47
Helping parents improve parenting	3.57	1.04	1	5	47

Research Question 10: How well do participants rate the *ADHD in the Schools* Training Program?

Participant satisfaction with the training was assessed. Since this research question was exploratory, no specific hypothesis was proposed. Participants responded to items regarding their satisfaction with the overall two-hour training program, the content, and the presentation style on a scale of (1) unsatisfactory to (5) very good. Participants were also asked to indicate the degree to which they would recommend the training program to others. Results indicated that participants were satisfied with all aspects, as no item was rated below a (3) satisfactory by any participant. Descriptive statistics are presented in Table 12. Each item had a possible range from 1 to 5.

Table 12

Descriptive Statistics of Participant Satisfaction Measure: Part B

	Mean	SD	N	Possible Range
Overall training	4.49	.62	47	1-5
Content	4.62	.64	47	1-5
Presentation	4.51	.62	47	1-5
Recommend to others	4.68	.47	47	1-5

Summary of Results

The results of this study reflect multiple signicant findings which are addressed in more detail in the subsequent discussion section. To review, regarding outcomes of the *ADHD in the Schools* inservice training program, teacher knowledge about ADHD and teacher perceived confidence in working with students with ADHD increased. In contrast, though a change was anticipated, teacher attitudes toward mainstreaming did not significantly improve as a result of participation in the training program. Self-report ratings about teacher efficacy in response to the *ADHD in the Schools* inservice training program were also gathered though changes were not anticipated or hypothesized.

Significant relationships among the aforementioned constructs were also found in this study. Specifically, a relationship was found between: 1) teacher

efficacy and teacher perceived confidence; and 2) teacher perceived confidence in working with students with ADHD and teacher attitudes toward mainstreaming students with ADHD. Relationships were not found between: 1) teacher efficacy and teacher knowledge about ADHD; 2) teacher efficacy and teacher attitudes toward mainstreaming students with ADHD; and 3) teacher perceived confidence in working with students with ADHD and teacher knowledge about ADHD, though significant relationships were predicted.

With regard to participant satisfaction, teachers in this study reported satisfaction with the ADHD inservice training program across all areas (i.e., overall session, content, and presentation style). Specifically, mean ratings for each area fell between "good" and "very good" with no teacher rating any area below "satisfactory." Additionally, mean teacher ratings reflected moderate to high satisfaction with the extent to which the presented inservice training program met their identified needs with regard to training about ADHD.

CHAPTER FIVE

DISCUSSION

The following discussion addresses the findings of this exploratory study in relation to the study hypotheses, in more detail. This study had three major goals: 1) to examine whether a two-hour training program aimed at teachers could improve their knowledge, perceived confidence, and attitudes toward mainstreaming students with ADHD; 2) to investigate the theoretical linkages among efficacy and some of the aforementioned constructs , as well as teacher perceived confidence and some of the aforementioned constructs, and 3) to evaluate if teachers in the identified district were satisfied with the training program presented on ADHD. Each of these areas will be discussed below. Subsequently, limitations of the study will be delineated. Following, theoretical and practical implications of this study will be addressed. Finally, possible directions for future research will be suggested.

Outcomes

Since this study included a training component, teacher outcomes of the developed inservice training program on ADHD were investigated. Specifically, in this study, gains in teacher knowledge, perceived confidence, and attitudes toward mainstreaming, with respect to students with ADHD, as a result of the developed inservice training program, were measured as discussed below.

Teacher Knowledge Regarding ADHD

Results of this study demonstrated that the developed ADHD inservice training program was successful at improving teacher knowledge with regard to ADHD. Similarly, previous research has demonstrated that inservice programs have been successful at increasing teacher knowledge about ADHD (Bos et al., 1997; Kallas et al., 1997; Marchant & Siperstein, 1997; Montague et al., 1997; Worthington et al., 1997). However, the aforementioned previous studies investigated knowledge gains as a result of inservice training programs of significantly longer duration, ranging from a full day to several months, the latter of which is rarely feasible within the educational setting.

It is significant that in this study, knowledge gains were evident as a result of a much shorter teacher inservice program. This gain in knowledge, as a result of reduced instructional time, may have resulted from the fact that the program presented to participants in this study was designed, developed, conducted, and continually evaluated with the specific needs of the intended audience in mind. Therefore, it appears that when training is developed with input from the intended participants, while keeping in mind the participants' overall needs and goals, it is likely to be effective, despite being of shorter duration, as it will likely address the specific identified needs of the program users.

Clearly, this type of inservice training is important as teachers continue to receive limited training on ADHD, as evidenced by 70% of the respondents in this

study indicating that they have received less than three hours of training on ADHD during their coursework. Additionally, once in the workforce, inservice education continues to be lacking. The current study demonstrates that 77% of the participants reported receiving less than eight hours of inservice training on ADHD once they began working. This supports previous findings that indicated that once in the workforce, 85% of respondents had received less than 5 hours of inservice training on ADHD (Worthington et al., 1997) and 80% of teachers report receiving negligible training on ADHD (Ch.A.D.D., 1992; Hawkins et al., 1991; Piccolo-Torsky & Waishwell, 1998). Despite this limited training, teachers continue to be expected to work with students with ADHD on a daily basis. Alarmingly, previous research noted that 85% of teachers reported teaching a student with ADHD despite the majority of them having not received sufficient training to do so (Hawkins et al., 1991). A study conducted four years ago noted that despite limited knowledge and training, 52% of teachers reported having taught one child with ADHD (Sciutto et al., 2000). The present study further highlights this growing problem, as a large proportion of teachers (45% of respondents) reported teaching numerous students (21 or more) with suspected and/or diagnosed ADHD despite not having adequate training.

The present study demonstrates that teacher knowledge about ADHD can be significantly improved with a very short inservice presentation (i.e. two hours). Since all teachers are increasingly expected to work with students with ADHD,

this finding suggests that all teachers should have the opportunity to learn more about ADHD in the work environment, as an inservice of this duration does indeed improve teacher knowledge about this disorder. This limited time commitment could translate into notable benefits for students in the classrooms, if teachers are able to utilize the acquired knowledge once they return to their teaching.

Teacher Perceived Confidence in Working with Students with ADHD

Teachers in this study (comprised of both those in general education settings and those in special education settings), reported improved perceived confidence in working with students with ADHD as a result of participating in the ADHD inservice training program. Though teacher perceived confidence in working with students with ADHD was previously investigated (Reid et al., 1994), change in perceived confidence as a result of an intervention, such as a teacher inservice program, has not been previously investigated, as it was in the present study.

The finding that a two-hour inservice program is effective at increasing perceived teacher confidence is an important result as it suggests that teacher confidence can surprisingly be changed within a short period of time, if the program takes into consideration the needs of the identified audience.

Investigation of individual items on the Teacher Perceived Confidence in Working with Students with ADHD measure demonstrates that teachers reported

feeling most confident in their ability to create a classroom environment in which students with ADHD feel accepted, as well as fostering acceptance and understanding in classmates who might be critical of students with ADHD. Though teachers still reported feeling confident, they were relatively less confident, as a group, with: 1) managing stress caused by students with ADHD, 2) setting up effective behavior contracts, and 3) being able to determine when behavioral progress is made among students with ADHD. The latter point highlights that if teachers have limited confidence in their ability to determine when behavioral progress in these students is evident, they are likely not able to determine with accuracy if and when recommended interventions are successful. This would be important to take into account when teachers discuss the effectiveness of implemented strategies toward improving student performance in the classroom.

The results on this measure from teachers suggests that school administrators, special education administrative staff, and school psychologists should specifically assist teachers who are challenged with working with students with ADHD. Assisting teachers in developing workable methods to effectively measure student behavioral progress (including utilizing behavioral contracts) might be instrumental in helping them improve their confidence in working with students. Additionally, it appears that teachers are indicating that they could benefit from additional support in managing their own stress associated with

meeting the diverse needs of these students. School staff might: 1) increase opportunities to assist with specific cases; 2) provide relevant materials on instructional and or behavioral strategies; 3) create opportunities for collaborative team problem-solving; and 4) encouraging personal outlets to manage stress to assist teachers in feeling more confident in working with students with ADHD.

Teacher Attitudes Toward Mainstreaming Students with ADHD

Though previous studies demonstrated a relationship between teacher attitudes toward mainstreaming students with special needs and number of classes taken, including inservice education (Bender & Vail, 1995; Schumm et al., 1994), this relationship was not previously specifically investigated with regard to ADHD. In the present study, teacher attitudes toward mainstreaming students were explored with specific regard to working with students with ADHD. Results reveal that teacher attitude toward mainstreaming students with ADHD did not improve as result of participation in the inservice training on ADHD.

One potential explanation for this non-significant finding is that teacher pretest scores on the Teacher Attitude Toward Mainstreaming Students with ADHD measure indicated that participants had very favorable attitudes toward mainstreaming prior to the training (pretest *Mean*=41.98, *SD*=5.98) which were maintained after the training session (posttest *Mean*=42.51; *SD*=6.33). It is plausible that since the teachers held relatively positive views of mainstreaming from the onset, that the present inservice training was not powerful enough to

bring about additional change in attitude toward mainstreaming in this sample of teachers. This view is further substantiated by previous research that suggested that over one-third of teachers demonstrated a lack of support of mainstreaming (Bender & Vail, 1995) compared to the present study in which less than one-fifth (19%) of teachers demonstrated a lack of support of mainstreaming at pretest. After the training, less than 10% of teachers in this study demonstrated lack of support for mainstreaming (as evidenced from the number of teachers who responded with the rating of "3" or less on Item 1 on Teacher Attitudes Toward Mainstreaming Students with ADHD measure).

The school district in which this study was conducted adheres to a least restrictive model of special education support, with the majority of special education students being served within the regular education setting with modifications and special education support rather than more traditional pull-out models. Therefore, it is possible that no significant improvement in attitude toward mainstreaming was noted due to the specific sample being studied. The first two items (pretest) on this measure support this suggestion as the mean participant ratings on Item 1 (*I support mainstreaming for students with ADHD*) and Item 2 (*I believe that mainstreaming has been beneficial for students with ADHD*) were very favorable (Item 1 *Mean*=4.16, *SD*= .90; Item 2 *Mean*=4.16, *SD*=.77). Item 11 (*I believe that students with ADHD should be referred for special programs (i.e. Special Education, Section 504 services)* was rated the

lowest among participants (*Mean*=3.20, *SD*=1.24), again indicative of a group that maintains a favorable attitude toward mainstreaming rather than referring students for additional support.

Another possible explanation for this non-significant finding could be that regular education and special education teachers differed on their attitudes toward mainstreaming, as this has been demonstrated by previous research (Brook, Watembert, & Geva, 1999). The current study did not separate teachers into these groups to be able to address this possibility; therefore the acquired results might have obscured a significant difference.

Teacher Efficacy

Though no specific hypotheses for changes in efficacy as a result of the inservice training were proposed, results demonstrate that efficacy remained quite stable from pretest (*Mean*=23.07, *SD*=3.89) to posttest (*Mean*=23.00, *SD*=5.10), as expected. Changes in efficacy as result of the training program were not hypothesized, as efficacy beliefs are presumed to be relatively stable once they are set (Tschannen-Moran & Woolfolk Hoy, 2001). It has been found that in the absence of lengthy, powerful interventions, efficacy is not likely to easily change (Henson, 2001; Ross, 1994). This leads to the future question of what kinds of programs are strong enough to produce a change in efficacy.

If efficacy can be changed with inservice training, it is unlikely that a program of such short duration, as that in the present study, would bring about

such changes. This view is supported by a previous study in which an eight-month staff development program was found to be too weak and too short to bring about changes in personal teaching efficacy (Ross, 1994).

Additionally, in the present study, information about teacher efficacy was not sought from participants with specific regard to working with students with ADHD. In light of recent trends in the study of efficacy, in which efficacy is being investigated as a context-specific construct, this may have been a shortcoming of the present study (Brownell & Pajares, 1996; Tschannen-Moran & Woolfolk Hoy, 2001; Wheatley, 2002). Specifically, this relatively new direction in the research implies that teachers do not feel equally efficacious in all teaching situations, across all subject matters (Brownell & Pajares, 1996), or with all types of student behavior problems (Meijer & Foster, 1988; Soodak & Podell, 1993) which supports the investigation of efficacy with specific regard to working with students with ADHD in the future.

Theoretical Linkages

In addition to addressing outcomes of the inservice intervention delivered to teachers, the present study also explored relationships among the constructs of teacher efficacy, confidence, knowledge, and attitude toward mainstreaming.

Teacher Efficacy and Teacher Perceived Confidence

In the present study, a significant relationship was found between teacher efficacy and perceived teacher confidence in working with students with ADHD,

as hypothesized. Though previous research, as described below, addressed the relationship among these two constructs, the relationship between efficacy and confidence was not previously investigated with specific regard to working with students with ADHD, as it was in the present study.

The definition of efficacy assumes a relationship with confidence. One definition of efficacy is "teachers' evaluation of their abilities to bring about positive student change" (Gibson & Dembo, 1984, p. 570). Previous research has supported this relationship, describing teachers high in efficacy as having higher confidence (Wheatley, 2002) particularly in their teaching abilities (Guskey & Passaro, 1994). Similarly, in a review, it was reported that teachers who demonstrate a high sense of efficacy are confident that they are able to engage in more effective strategies with students with learning and behavioral problems (Brownell & Pajares, 1996; Gibson & Dembo, 1984; Guskey, 1988; Tschannen-Moran & Woolfolk Hoy, 2001) and are less likely to refer difficult to teach students for special education (Meijer & Foster, 1988; Podell & Soodak, 1993; Soodak & Podell, 1996).

Discovering a relationship between efficacy and perceived teacher confidence in working with students with ADHD is an important finding in that perceived confidence and efficacy are central factors related to the likelihood of teachers incorporating knowledge and skills acquired from training into their classrooms once the training is over. In fact, previous research has found teacher

efficacy to be positively related to student outcomes (Gibson & Dembo, 1984; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998; Woolfolk, Rosoff, & Hoy, 1990). Perhaps further inquiry in the future would demonstrate that significant increases in perceived confidence might indirectly lead to increases in teacher efficacy, as this study established a relationship among these constructs.

Teacher Efficacy and Teacher Attitudes Toward Mainstreaming

The present study failed to find a significant relationship between teacher efficacy and teacher attitudes toward mainstreaming students with ADHD. Most previous research in this area did not directly address teacher efficacy in relation to teachers' attitudes toward mainstreaming students with ADHD but rather inferred it. For example, one study found that teachers with a high sense of efficacy were more likely to work longer with a student who is struggling (Gibson & Dembo, 1984) and were less likely to refer a difficult student for special education services (Meijer & Foster, 1988; Podell & Soodak, 1993; Soodak & Podell, 1993), however assessment about overall attitudes toward mainstreaming was not addressed. More recently, one research study found a more direct relationship between personal teaching efficacy and attitudes toward mainstreaming (Bender & Vail, 1995), however, the relationship was not explored with regard to ADHD, as in the present study.

A change in teacher attitudes toward mainstreaming was not found as a result of the teacher ADHD inservice training program. Similarly, though not

directly hypothesized, efficacy scores were fairly stable from pretest to posttest, indicating that the inservice training had relatively little impact on efficacy. Therefore, attitudes toward mainstreaming students with ADHD and teacher efficacy appear resistant to change within a short inservice training intervention.

Though previous studies demonstrated a potential relationship between teacher efficacy and teacher attitudes toward mainstreaming those findings were not replicated in the current study. Several factors might explain this difference. First, previous studies did not specifically address teacher attitudes regarding working with students with ADHD, as was done in the present study. Additionally, most previous research was conducted with regular education teachers, whereas the sample in the current study encompassed both regular education and special education teachers. Finally, other studies investigated the broader construct of teacher efficacy, without differentiating between personal and general teaching efficacy, whereas the present study only investigated personal teacher efficacy. In essence, though previous research demonstrated a relationship between teacher efficacy and teacher attitudes toward mainstreaming; when the scope of investigation was narrowed to consider just one type of student behavior issue (i.e., ADHD) and one subset of teacher efficacy (i.e., personal teaching efficacy), a relationship was not evident, suggesting that the constructs, as defined in this study, are indeed separate and independent.

Teacher Efficacy and Teacher Knowledge

The investigation of the relationship between teacher efficacy and teacher knowledge about ADHD demonstrated no significant correlation between these constructs. Previous research found a relationship between knowledge of ADHD and what the authors called "efficacy" (Sciutto et al., 2000). However, it is important to note that the authors measured teacher efficacy with responses to one question, asking teachers to rate, on a Likert scale, the extent to which they felt they could effectively teach an ADHD child (Sciutto et al., 2000). In light of the plethora of measures of efficacy available, this appears to be a significant methodological limitation in this previous study, thereby greatly limiting the implications of their finding. Though confidence and efficacy appear to be related concepts, results of this study, in contrast to previous research (Reid et al., 1994), demonstrates that they are not synonymous.

A previous study noted that use of, rather than exposure to, inservice knowledge contributed to changes in self efficacy (Ross, 1994) but this study was not done with specific regard to ADHD. Follow-up studies demonstrated that efficacy was not changed in response to knowledge imparted in inservice training, when the inservice made no attempt to influence teacher beliefs directly (Ross, 1995). In the present study, teachers' use of information acquired through the inservice was not investigated or measured thereby limiting the discussion of this explanation.

Teacher Perceived Confidence and Teacher Attitudes Toward Mainstreaming

The results of this study demonstrate a positive relationship between teacher perceived confidence in working with students with ADHD and teacher attitude toward mainstreaming students with ADHD. However, it is important to note that the correlation was low, indicating a weak relationship among these constructs.

Previous research indicated that teachers lacking knowledge, skills and confidence are not willing to have students with disabilities in their classrooms (Schumm & Vaughn, 1992; 1995; Whinnery et al., 1991). However, this was not previously investigated with specific regard to students with ADHD, therefore the present study expanded on the previous literature by addressing a specific disability category.

This finding implies that teachers who feel more comfortable or confident in working with students with ADHD are also more likely to support mainstreaming of students with ADHD. This is an important finding when attempting to address the overidentfication phemomenon, in which students with ADHD are being increasingly referred for special education services and placed into more restrictive settings. This finding implies that the more confident a teacher is, the better they feel about working with a student with ADHD in their classroom. In future research, teacher confidence in working with students with

ADHD and likelihood to refer students with ADHD for special education services should be more directly addressed.

Furthermore, this finding supports the need for additional training for teachers in order to improve their confidence in working with students with ADHD and perhaps, student outcomes. Though merely speculative, improved confidence in the area of ADHD might be linked to improved teacher interactions with students with ADHD, increased collaboration with parents of students with ADHD, and a greater willingness among teachers to try multiple interventions to improve the functioning of these students.

Teacher Knowledge and Teacher Perceived Confidence

Results of the present study failed to find a relationship between ADHD knowledge and teacher perceived confidence in working with students with ADHD. Previous research found a relationship between teacher perceived confidence in working with students with ADHD and knowledge, however knowledge was not assessed directly, but rather was inferred from amount of prior training teachers received on ADHD (Reid, et al., 1994). Additionally, another previous study found a relationship between teacher knowledge and teacher confidence, however there were limitations from the method in which they operationalized confidence; utilized one single Likert question to measure teacher confidence (Sciutto et al., 2000).

It appears from the results of this study, that training aimed at increasing teacher knowledge, will not likely also result in increases in teacher perceived confidence without specific attempts at doing so. Apparently, something else must be present in order to increase confidence.

This finding should be considered in the development of future inservice programs so that program developers are aware that merely presenting knowledge about a disorder may indeed increase teacher knowledge, but that in the absence of other programmatic differences, this increase in knowledge will likely not be coupled with improvements in teacher confidence. It appears that another component must have been present in the current inservice training that increased confidence independent of increasing knowledge. This finding supports the need for further study about the relationship between knowledge and confidence and to identify factors that are related to improvement in confidence. Perhaps teacher confidence increased in the present study due to a combination of the following factors: 1) teachers gathering with colleagues to discuss problem behaviors and intervention suggestions for students with ADHD; 2) teachers feeling validated by their colleagues and inservice facilitator about challenges associated with managing students with ADHD; 3) teachers engaging in group problem-solving activities that were employed in the present training to address common issues with managing students with ADHD; or 4) teachers realizing that there was no singular "magic" intervention that would equally address the common issues of

students with ADHD, as the diverse manifestation of symptoms and co-morbid difficulties necessitate unique intervention approaches. In sum, the finding that teacher knowledge about ADHD and teacher perceived confidence in working with students with ADHD are not correlated raises additional questions about how to impact changes in these areas.

Participant Satisfaction

Information about participant satisfaction with the inservice program presented on ADHD in the present study was assessed in two ways at the conclusion of the training. The second part of the Participant Satisfaction Form reflected a more typical evaluation form in which participant reactions to the inservice program were solicited. Results are discussed below. The first part of the same measure assessed the extent to which participants felt that the inservice training met their identified needs across a variety of previous delineated categories. A discussion of these findings follows the reaction evaluation findings.

Teachers were asked to give their reactions to the training at the end of the session. As explained earlier, on the first three questions, teacher were asked to rate each item on a Likert Scale (where 1=unsatisfactory, 2= needs improvement, 3= satisfactory, 4= good, and 5= very good) and space was provided for them to explain their ratings. With regard to the overall session, mean participants' ratings were positive. Respondents felt that the overall training was appropriate

as the average rating fell mid-way between "good" and "very good" (*Mean*= 4.49, *SD*=.62). Corresponding write-in comments were all quite positive. With regard to the overall session, teachers commented about breath of information presented (e.g., "Very thorough—covers many aspects of ADHD") and the utility of the information delivered (e.g., "Information was extremely well presented and relevant to educators"; "A lot of information that will be helpful especially in dealing with parents").

Ratings with regard to the content presented reflected satisfaction with the material that was presented. Ratings for the group of teachers fell well above the "good" rating, approaching the "very good rating" (*Mean*=4.62, *SD*=.64). With regard to the content presented, teachers again made very positive comments though a couple of participants noted that there was a lot of information presented for the designated time period (e.g., "Lot of info for short time—like to have several different classes available to target more specific needs"). However, the vast majority of the participants commented about being pleased with the content being current, research-based, thorough, and relevant (e.g., "In our schools, ADHD is a very big reality"; "This information truly helped clarify and reinforce information").

Participants also rated the presentation of the material. Mean scores demonstrated that teachers as a group felt that the presentation was midway between "good" and "very good" (*Mean*=4.51, *SD*=.62). Comments addressed

satisfaction with the materials, such as the visual aides, handouts, and overhead cartoons (e.g., "PowerPoint, handouts, and sense of humor"; "Great slides and handouts, great speaker"). Participants also commented about the professionalism of the presentation and speaker (e.g., "Succinct, articulate, yet plain spoken enough to easily absorb and understand"; "Professional and educational"). Similar comments were made about maintaining interest (e.g., "Good eye contact, loud enough, and walked around"; "Liked personal stories, jokes, would like more hands on/group work"). Participants during the last session commented about the presentation feeling rushed which was indeed the case as a problem with the room's air conditioning and request for maintenance resulted in a delay and a couple of interruptions during that final session.

Finally, teachers were asked to rate if they would recommend this session to others by using a Likert Scale (where 1=definitely would not, 2=probably would not, 3=might or might not, 4=probably would, and 5=definitely would). Mean ratings of whether or not participants would recommend the training to others yielded a very favorable score (*Mean*=4.68, *SD*= 47) falling between "probably would' and "definitely would." Comments essentially reflected the relevancy of the material to their current roles in the classroom (e.g., "A must for all teachers with inclusion/mainstreaming of all students"; "It answers a lot of questions teachers have"; "Best session on ADHD I have ever attended"; "One of

the best sessions on disabilities I have ever attended"; "I think all teachers and staff need this").

Teachers also made some suggestions for improvement, the most prevalent of which was increased time (e.g. "Having longer period of time to cover some issues more in-depth"; "Make it longer."). In the future, increasing the length of time of the inservice may make it more likely to encompass other aspects that might impact less malleable constructs, such as attitudes toward mainstreaming and teacher efficacy, which not affected by the shorter training program presented in this study. A few respondents suggested increased attention on classroom intervention strategies. A couple of others mentioned additional, advanced classes to address more specific needs and managing students with ADHD with comorbid disorders. Single comments included: offering the session prior to the start of school, addressing methods to assist students at home, role-playing of characteristics of ADHD and ODD, slowing down the presentation of the material, and a more open forum with guided discussion.

As described prior, during an earlier pilot study, educators in the district were asked to note what they hope to learn from the developed ADHD training, prior to being presented with the training. Some modifications to the training program were made as a result of these comments. Additionally, these comments formed the basis of Part A of the Participant Satisfaction Measure. Participants in

the current study rated these items to the extent of which the training met their needs in each area.

Results of this study demonstrate that overall, teachers felt that the training session on ADHD more than adequately met their needs (*Mean*=93.47 (out of a possible total of 115), *SD*=14.407). Ratings on individual items (using a Likert Scale, where 1=not at all, 2=a little, 3= enough, 4= very well, and 5= extremely well), demonstrate that the background discussion on aspects of ADHD (including characteristics, causes, prevalence, developmental course, and ways to recognize ADHD) met the participants' needs best. This is likely due to this content was addressed in the first third of the training session, in great detail. Participants indicated that information presented during the training session on communicating with parents and increased understanding of the role, support and referral process within the school district were also rated as meeting their needs "very well." This favorable rating is likely due to the very specific, district-oriented information that was provided during the training session on the specific role of teachers within the district, as supported by federal law, state legislation, and district policy and procedures. Slightly lower ratings were given to the discussion on specific intervention strategies during the training (falling between "enough" and "very well"), though this aspect was still rated within an acceptable range. Brainstorming and group problem-solving was utilized to address intervention strategies and the discussion that ensued varied per training session

due to the unique group composition of each training session. A model, adhering to functional behavioral assessment, was utilized to introduce teachers to various intervention strategies in conjunction with some practice in utilizing a provided Intervention Guide. Rather than reviewing multiple, specific intervention strategies one by one, an overall approach to choosing intervention strategies was presented to participants. The format of the questions on the Satisfaction Form, however, did not allow participants to address the way the interventions were presented, but rather it asks about specific strategies. Future use of this measure, should modify this section. Though ratings of the discussion of specific intervention strategies was slightly lower, the discussion on medication options clearly met the needs of the participants as it was rated between "very well" and "extremely well" in meeting participants' needs. Again, very specific information was provided about medication management and the role of teachers within the given school district with regard to medication, which is likely to account for the favorable ratings.

Limitations

Despite the positive findings of this study there were limitations that need to be addressed. Firstly, it is likely that the sample was biased as the participants represent a nonrandom sample of teachers. Participation in this study was a result of teachers volunteering to take part in ADHD training by registering via the on-line staff development system in the district. One way to lessen this impact would

be to collect teacher information during one of the principal-supported and/or mandated trainings on each campus to eliminate the bias of self-selection.

Additionally, the sample may have been biased due to the time of year during which the training was offered. Since this training was offered during the Spring semester, immediately prior to the state mandated high stakes academic testing, perhaps teachers attending the training were currently struggling with the specific problematic functioning of a single student with ADHD in their classroom, and entered the training with a need to ameliorate the specific concerns of this single student. This may have resulted in the teachers in the sample, representing significantly more serious ADHD cases than normally expected. To overcome this potential difficulty in the future, it might be better to offer the training during the summer, prior to the school year beginning, so that teachers can openly accept information about the disorder without the bias of cases they were contending with at the time.

Also, this sample may have been biased since it was all collected in one school district, albeit it a large district (74,736 students; 5,156 teachers). Less than 10% of students (7,100) are identified as having disabilities in this district. However the schools, and ultimately the teachers, in this district adhere to a particular model of special education support for students with mild disabilities, such as ADHD. Students with disabilities in this district receive support services within five main settings: 1) as part of an inclusion model, with paraprofessional

support; 2) within the co-teach setting, with both a special and regular education teacher; 3) within a self-contained setting taught by a special education teacher only; 4) within the regular education setting with modifications only; and 5) within the regular education setting without support. Thus, generalizability to other school districts might be limited.

Additionally, the socioeconomic status (SES) of the families in this district is likely to be higher than that among more urban areas. Information published by the district indicates that only 26% of students received free/reduced lunch during the past academic year (Cypress-Fairbanks ISD, 2003-04). Similarly, the drop-out rate in the district is .2%, and the attendance rate is 96%, which is more favorable than neighboring districts (Cypress-Fairbanks ISD, 2003-04). The higher SES of this district might have an unexpected effect on teacher exposure to ADHD, as it is plausible that within higher SES settings, parents are more cognizant of difficulties associated with ADHD and are more likely to request assistance from school staff in meeting their child's needs. A related point is that psychological services in this district are offered by licensed, doctoral level psychologists, or doctoral-level psychology interns. The district earned the "Outstanding Delivery of Psychological Services by a School District Award" during the 2002-03 academic year for the services offered by the Department. It is likely that this highly specialized staff is unique to school districts, perhaps

offering specialized training and knowledge about ADHD, and thereby further limiting the generalizablity of the results of this study.

Furthermore, the sample was restricted, as the training was only offered to elementary school teachers. In an effort to increase the generalizability of these results, future research should add, and perhaps compare, teachers from junior high and high school settings.

Methodological problems also contributed to limitations. First, a number of the measures were developed or adapted for the present study and did not have established psychometric properties. Though efforts were made at revising and improving the created Educator ADHD Knowledge measure, prior to its use in this study, which resulted in acceptable internal consistency, further use and modification of this measure will likely yield needed improvements to increase reliability.

Similarly, the Attitudes Toward Mainstreaming measure was adapted for the present training to specifically address students with ADHD, and no pilot data was collected to establish reliability. However, the reliability of the measure for the current sample appears adequate (r=.85) yet future research on this adapted measure would be useful.

Also, items were added to the Teacher Perceived Confidence in Working with Students with ADHD measure, to increase reliability. Again, no pilot data was collected on this adapted measure prior to use in this study. Again, reliability

based on use in this study appears adequate *(r*=.90), however it would be beneficial to see if future studies yield similar results.

Furthermore, the time between pretesting and posttesting was very short (approximately two hours) and may have measured practice effects and memory skills rather than change in knowledge, attitudes, and confidence. Again, teachers were likely cognizant of the expectation of improvement in knowledge, confidence, and attitudes after the inservice training and may have responded in such a way to reflect a positive outcome.

Though clearly beyond the scope of this study, no observational data were collected to corroborate teacher perceptions, which is another methodological limitation. All measures were self-reports and no efforts were made to collect other data to validate or substantiate teacher self-ratings. It might have been illustrative to compare teacher self-ratings with peer ratings of their confidence and attitudes toward working with students with ADHD. Additionally, no data was gathered to assess changes in behavior, attitudes, use of information within the classroom setting. Perhaps the increases in perceived confidence, for example, were merely a result of what other authors have termed the "happiness quotient" in which teachers rate themselves more favorably as they realize that is expected from pretest to posttest.

In addition to collecting information on the teachers' affiliation (regular versus special education), it would have been helpful to collect information about

the setting in which the participants taught, ranging from regular education setting, in-class support, co-teach setting, resource, or other self-contained settings. This might have been helpful considering that 44% of teachers in the present study reported that they teach across grade levels, which suggests that they are likely providing different levels of support for students. Additionally, this information would assist in discerning if teachers in more restrictive settings had different levels of perceived confidence, attitudes, and efficacy as they are likely serving students with more severe disabilities and greater comorbid disorders, which would likely impact outcome findings. Increasing sample size would allow for comparisons among teachers in different settings with regard to the areas investigated.

Similarly, grouping teachers into special education and regular education categories may have yielded clearer results. It is possible that special education teachers differ significantly from regular education teachers with regard to the preparatory training and inservice training that they receive with regard to students with ADHD. Consequently, teachers in general education versus special education would likely demonstrate differing knowledge, attitudes toward mainstreaming, and perceived confidence in working with students with ADHD. Sense of efficacy might also differ among regular and special education teachers. One study, in fact, demonstrated that special education teachers hold the most positive views of inclusion, as well as the highest perceptions of self-efficacy and

competence in working with students with mild disabilities (Minke & Bear, 1996), though ADHD was not specifically investigated.

Implications

Despite the aforementioned limitations, this study has useful implications for both practice and theory. The practice implications of this study are most obvious and extend to areas of education, special education, and school psychology. On the most simplistic level, this study supports that a relatively short training program is effective in increasing teacher knowledge and confidence about ADHD. This is important given that due to the increased emphasis in the schools on state mandated testing on the basic elements of the curriculum, teachers have limited time to attend training on individual disorders, ultimately affecting a small population of students. Rather, teacher time is spent in staff development efforts regarding curriculum issues with wider relevance, making attendance at full-day workshops for issues affecting a small percentage of students (such as ADHD) unlikely. This study suggests that is worthwhile for teachers to use a small portion of their day to address ADHD as it is possible to improve teacher knowledge and confidence in a relatively short period of time.

Perhaps another significant practical implication of this study is that by involving the intended audience during the program development and refinement phases of staff development, the impact on the participants is likely to be greater. In this study, considerable effort was dedicated toward seeking information about

district needs, district procedures, and the preferences of teachers in the district. Specifically, the needs assessment conducted prior to the training for this study allowed for continual refinement of the training program and closer adherence the participants identified needs. Though continued refinements would serve the developed program well, participants were satisfied with the presented inservice program on ADHD and in turn demonstrated improvement in knowledge and confidence. It is unclear about whether or not participant satisfaction is related to gains in knowledge and particularly confidence, but it might be prudent to investigate this in the future.

Though exploratory in nature, the present study lends itself to theoretical implications in the broad areas of educator training, program development. Additionally, the study advances knowledge in the specific areas of teacher confidence, efficacy, and teacher attitudes toward mainstreaming. Though not specifically addressed, the current study also leads to questions regarding the nature of teacher change.

The understanding of the outcomes is greatly enhanced by the understanding of the relationships among the constructs. For example, teachers might have necessary knowledge and skills and may not be utilizing them to the full benefit of students for other reasons that need to be addressed, such as limited confidence. Additionally, these findings lend credence to the idea that specific

attempts at improving teacher factors must be made at the program development level, in order for them to have a significant impact at the outcome of the training.

Furthermore, this study found relationships among several constructs. These links imply that these constructs should be studied jointly in future research in an attempt to disentangle the common elements and/or discern whether or not they are indeed separate constructs.

Future Directions

The teacher inservice training program on ADHD that was developed for the present study yielded improvements in teacher knowledge and teacher perceived confidence. Follow-up research should address long-term effects of the training and whether gains in teacher knowledge and confidence persist over time.

Efforts should be made to increase the generalizability of results. Other districts that vary with regard to SES, location, and special education support models should be investigated. Similarly, teachers should vary across grade levels and teaching setting (e.g., co-teach setting) to increase generalizability of results.

Additionally, this study was limited to teachers rather than all educators. Examining the knowledge, attitudes, and confidence of paraprofessionals is also important for future research, as increasingly aides are providing students with special needs needed support in the classroom (Giangreco et al., 2002) with

limited, if any, training. Little is known about the knowledge, confidence, and attitudes of paraprofessionals in working with students with ADHD.

Similarly, counselors, principals, school nurses, and other professionals also all play a role in working with students with ADHD. It might be beneficial to investigate the impact of this type of training on the knowledge and attitudes of other school staff.

Due to time constraints, the inservice training program presented in the present study was primarily didactic, with only limited opportunities for collaborative problem-solving. In future sessions, it might be helpful to provide diverse, more hands-on learning experiences that are more reflective in managing student classroom concerns. Perhaps a second session, aimed at teachers with increased interest in ADHD, which includes role-playing, modeling, and working with vignettes, would be more illustrative for teachers to be able to apply the presented skills to their classroom. Such advanced opportunities incorporated into professional development programs would help prepare teachers in meeting current classroom demands, as well as adhering to federal mandates for special needs students. These diverse training modalities may also differentially effect teacher outcomes, (e.g., perceived confidence and efficacy) though this would be purely exploratory in nature.

The research in the area of ADHD is increasingly focused on students with ADHD and comorbid learning and behavioral difficulties. Current studies are

researching the utility of interventions for students with ADHD in light of co-occurring difficulties. Addressing different constellations of symptoms might yield clearer information about teachers' confidence and attitudes toward mainstreaming students with more diverse needs, particularly in light of previous findings that suggest that student problem type and number of difficulties is likely to be related to referral patterns (Meijer & Foster, 1988; Soodak & Podell, 1993) as students with ADHD, who have a comorbid disability, are likely to be educated in more restrictive settings (Forness & Kavale, 2002). This should be specifically investigated with regard to ADHD and its commonly co-occurring difficulties.

During this technology-age, in which interactive, self-paced instruction is available via DVDs, teleconferencing, organizational intranet, the world-wide internet, and other self-study options, it would be interesting to investigate whether teachers would demonstrates significant outcomes via a different, more independent and self-paced delivery model of the training, that would be more sensitive to the limited time teachers have for staff development during the work week. For example, this current training program is presented via PowerPoint slides and is available on CD-R for district staff to utilize for training. It does not appear far-fetched that teachers could utilize the materials for a self-guided session. However, it would be interesting to note if similar gains would result during self-study, without the discourse, examples, and questions posed from

other participants when working in a collaborative group environment in learning the material.

Additionally, providing similar training to parents might be beneficial to assist in the collaboration between home and school. Collaboration with parents and educators would likely result in greater consistency for the child, as parents and teachers would share information, expectations, and intervention strategies.

Though clearly beyond the scope of this study, it would have been useful to collect information about teacher's utilization of new interventions and improved interactions with students with ADHD within the classroom after attending the training. Essentially, evaluating teacher skill development in working with students with ADHD would be an important next step that is not effectively measured by self-report. In future studies, extending the evaluation of the inservice program to include student outcomes would more completely assess the overall impact of the training program.

Concluding Comments

Teachers within schools are increasingly being expected to improve the academic and behavioral functioning of students with ADHD. Overall, this study demonstrated the benefit of sharing knowledge and intervention strategies about ADHD with classroom teachers to better support students with special needs. Perhaps the challenge of meeting the needs of students with special needs within

the regular education setting will lessen if teachers are afforded opportunities to engage in training on diverse disorders and intervention strategies.

Increasingly, school psychologists provide services to a growing number of clients, including school staff and students. Inservice training has been demonstrated to be an effective method for school psychologists to expand their impact within the school setting, while cost effectively reaching a broad audience. This mode of service delivery would also serve to address the increasing time constraints on the school psychologist's time, by impacting a large group of teachers within a limited timeframe. Furthermore, inservice training may help prevent more serious student difficulties, as it arms teachers with knowledge and methods of management to problem-solve earlier, thereby reducing the likelihood of student failure.

Students with ADHD vary considerably; therefore, a variety of methods for working with them will be necessary for teachers to employ. Though education on diverse strategies to adapt instruction, environments, and behavior will likely be helpful, teachers will also benefit from training that will increase their comfort in working with these students. Increased confidence, improved attitude and greater sense of efficacy will likely enable teachers to more comfortably make adaptations and utilize effective problem-solving to meet the individual needs of a very diverse population within the school setting thereby

being better able to rise to the challenge of increased inclusion of special needs students.

APPENDIX A

DIAGNOSTIC CRITERIA FOR ADHD

Inattention

- often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities
- often has difficulty sustaining attention in tasks or play activities
- often does not seem to be listening when spoken to directly
- often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand directions)
- often has difficulty organizing tasks and activities
- often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (schoolwork or homework)
- often loses things necessary for tasks or activities (e.g., toys, school assignment, pencils, books)
- is often easily distracted by extraneous stimuli
- is often forgetful in daily activities

Hyperactivity

- often fidgets with hands or feet or squirms in seat
- often leaves seat in settings in which remaining seated is required
- often runs about or climbs excessively in situations in which it is inappropriate (in adults and adolescents may be limited to subjective feelings of restlessness)
- has difficulty playing or engaging in leisure activities quietly
- is often “on the go” or acts as if "driven by a motor"
- often talks excessively

Impulsivity

- often blurts out answer to questions before they have been completed
- often has difficulty awaiting turn
- often interrupts or intrudes on others (e.g., butts into conversations or games)

Note. Summarized from DSM-IV, American Psychiatric Association, 1994, pp. 83-84.

APPENDIX B

LITERATURE REVIEW OF ADHD

ADHD is widely considered a neurobiological disorder comprised of a constellation of chronic symptoms and has been found to exist in every country in which it has been investigated (Barkley, 1998). Depending on the criteria used and the country studied, world-wide estimates of prevalence of ADHD range from 1.8% (Verhulst, van der Ende, Ferdinand, & Kasius, 1997) to 29% (Bhatia, Nigam, Bohra, & Malik, 1991). In the United States, an estimated 5-10% of the entire population has ADHD (Leimkuhler, 1994; Whalen & Henker, 1991). Among school-age children, 3-5% meet the criteria for ADHD, (American Psychiatric Association, 1994) which translates to approximately 2 million children in the United States alone (Barkley, 1990; Pelham, 1982; Schaub, 1998).

Though it had been previously believed that the vast majority of children with ADHD outgrow the symptoms by adolescence and adulthood (Garfinkel & Klee, 1985; Jordan, 1988; Weiss & Hetchman, 1993; Wender, 1987; Quinn, 1995), this claim has been consistently disputed. There is a convergence of data which suggests that up to approximately 80% of children with ADHD continue to display symptomatology into adolescence (Barkley, 1990; Barkley, Fischer, et al., 1990; Weiss & Hechtman, 1986; 1993), and up to 50% have continued difficulties into adulthood (Barkley, 1989; Kane, Milkalac, Benjamin, & Barkley, 1990).

History

The first references to ADHD are dated around 1865 with the poems of the Heinrich Hoffman, a German physician, and his descriptions of "Fidgety Phil" and "Johnny Head-in-the-air" (Hallowell & Ratey, 1994; Barkley, 1998). Yet another physician, George Still, has been credited as being one of the first authors to focus scientific attention on this disorder in the early 1900s, as he described these children as having a major "defect in moral control" due to their diminished "inhibitory volition" and need for immediate gratification (Hallowell & Ratey, 1994). Around 1918, the term "Postencephalitic Behavior Disorder" was coined to describe the behavior of children who survived brain infection but were left with impaired attention, impulsivity, and other cognitive deficits (Barkley, 1990). In the 1930s and 1940s, research focused on the behavioral disorders of children with brain impairments, along with those hospitalized at psychiatric facilities. It was at this time that the treatment of affected children with amphetamine drugs began (Barkley, 1998).

During the 1950s, a group of children that was distinctly different than their peers were being noticed in the classrooms (Barkley, 1998). These children were characterized by poor listening skills, distractibility, difficulty following directions, poor retention, low frustration tolerance, impulsivity, destructiveness, hyperactivity, and trouble fitting into social groups (Fadley & Hosler, 1992; Jordan, 1988). The term "Minimal Brain Dysfunction" (MBD) emerged to

describe them (Barkley, 1998). However, a wide variety of disorders, including those associated with brain injuries, mental disorders, genetic disorders, and perinatal complications were also classified under the rubric of MBD at that time, which further blurred the diagnosis. This term soon gave way to more observable descriptors of behavior.

In the 1960s and 1970s, the terms "hyperactivity" and "hyperkinesis" were derived to differentiate disorders of attention, impulsivity, and hyperactivity from other disorders (Biederman, Newcorn, & Sprich, 1991; Hoff et al., 2002) and the disorder was termed "Hyperkinetic Reaction of Childhood" in the second edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-II; American Psychiatric Association, 1968). Subsequently, special education programs emanated that resulted in the education of these children away from the mainstream.

Slowly, distinctions between hyperactivity and inattention became apparent though many continued to use the terms interchangeably (Hoff et al., 2002; Spreen, Risser, & Edgell, 1995). By 1980, the more familiar term, Attention-Deficit Disorder (ADD), emerged with the publication of the DSM-III (American Psychiatric Association, 1980), which delineated differences between ADD with and without hyperactivity (Hoff et al., 2002). With the revised third edition (DSM-IIIR), the term Attention-deficit Hyperactivity Disorder was introduced (American Psychiatric Association, 1987). However, instead of

subtypes, the category of "Undifferentiated ADHD" was used to identify individuals without signs of impulsiveness and hyperactivity. The DSM-IV, published in 1994, continues to call the condition Attention-Deficit/Hyperactivity Disorder (ADHD), however subtypes were again demarcated, as described below (American Psychiatric Association, 1994).

Clearly, though the diagnostic terms have evolved, the nature of the disorder of ADHD has changed very little from the descriptions that have been considered for a century (Barkley, 2003).

Recent Conceptualization

Recent conceptualizations has led to the conclusion that ADHD is not primarily a disturbance of attention, as previously thought, but more likely a disturbance in response inhibition (Barkley, 1997a, 1997b, 1998, 2003). A theory-based model, driven by the work of Barkley, is currently being advocated in contrast to the clinical view supported by the DSM descriptors of the disorder (Barkley, 1997a, 1997b, 1998, 2003). This more recent work conceptualizes ADHD as problems with response inhibition, self-regulation, and executive functioning (Barkley, 2003). Specifically, iIt is suggested that ADHD causes difficulties with disinhibition, or the ability to regulate one's own behavior, impulses, and emotions (Barkley, 1998; Schaub, 1998). This results in the individual's behavior being managed more by immediate impulses and urges rather than by rules, consequences, and previous learning experiences (Barkley,

1998; Schaub, 1998). According to this view, children with ADHD are less able to inhibit their behavior compared to their peers (Hoff et al., 2002). Specifically, Barkley contends that children with ADHD exhibit difficulties with executive functioning that further interferes with working memory, internalization of speech, self-regulation of affect, and the ability to reconstitute meaningful language (Barkley, 1997a, 1997b, 1998), which in part serves to explain the related difficulties concomitant with ADHD.

It is important to note that with this advanced theory formulation, Barkley is mainly referring to children with ADHD that display hyperactive and impulsive behaviors, as he believes that children with inattentive features are exhibiting a distinct disorder that is otherwise explained (Barkley, 2003; Hoff et al., 2002). In contrast, others believe that difficulties with hyperactivity and inattention are both related to disinhibition (Teeter & Semrud-Clikeman, 1997). With continued discussion and research, it is likely that the conceptualization of ADHD will continue to evolve in the years to come.

Diagnosis

Presently, the criteria used for diagnosis of ADHD are those set by the DSM-IV (American Psychiatric Association, 1994). According to these criteria, deficits, typically displayed prior to the age of seven, manifest themselves to a greater degree than is expected for the individual's developmental level and are present in two or more settings for a period of at least six months. Furthermore,

in order for a diagnosis to be made, there must be evidence that there is clinically significant impairment in social, academic, or occupational domains to a degree beyond that expected of individuals of the same mental age (American Psychiatric Association, 1994).

One of the main difficulties for individuals with ADHD is the inability to sustain attention. That is, they have trouble remaining vigilant to tasks long enough to complete them and are also easily distractible (Barkley 1998; Landau & Burcham, 1995). Another primary symptom of ADHD is impulsivity or behavioral disinhibition, which is often characterized by an inability to suppress inappropriate behavior and/or to delay gratification (Barkley, 1990, 1997; Landau & Burcham, 1995). Additionally, individuals with ADHD commonly demonstrate hyperactivity, overactivity, or feelings of restlessness.

There are three subtypes of ADHD: ADHD Predominantly Inattentive Type; ADHD Predominantly Hyperactive-Impulsive Type, and ADHD Combined Type, which is the most prevalent (American Psychiatric Association, 1994). The Predominantly Inattentive Type and the Combined Type both demonstrate attention problems, whereas the Hyperactive-Impulsive Type does not (Barkley, 1997a, 1997b). Specific criteria for the diagnosis of ADHD are delineated in the DSM-IV (American Psychiatric Association, 1994; see Appendix A). In an attempt to elucidate the meaningfulness of the diagnosis of ADHD as per the DSM criteria, a study was conducted in which 75 children previously diagnosed

with ADHD were referred to a multidisciplinary hospital clinic for re-evaluation as a result of previously ineffective interventions (Sabatino & Vance, 1994). Senior staff at the clinic collected behavioral, psychological, and medical data on each of the 75 children. Alarmingly, 44 of the originally diagnosed cases, or 58% of the children, were found to have been inaccurately diagnosed with ADHD, in essence, speaking to the continued difficulty of applying accepted criteria for diagnosis (Sabatino & Vance, 1994).

Developmental Course

Understanding the developmental course of ADHD provides a perspective on how the symptoms of the disorder vary across the life-span and how they affect the adjustment of students at each developmental stage. Rarely are the difficulties of the student limited to the symptoms of ADHD, as many have co-occurring conditions that also greatly impact their functioning. When considering treatment options for individuals with ADHD, it is important to address how the symptoms of the disorder interact with the demands of each developmental phase (Teeter, 1991) particularly when planning for interventions across grade levels.

Preschool

As infants, many children with ADHD have difficult temperaments, cry easily, and are not easily soothed (Barkley, 1998; Weiss & Hechtman, 1986; Wender, 1987). Due to the expectations placed on preschool children to begin to comply with requests, conform to rules, and play cooperatively (Weiss &

Hechtman, 1993), ADHD is often first noted at 3-4 years of age (American Psychiatric Association, 1994; Barkley, 1989; Teeter, 1991, 1998; Weiss & Hechtman, 1986). Yet, there still is a reluctance to diagnose children at this age because of the great variability of what is still considered "normal" development at this stage (Barkley, 1990; Batsche & Knoff, 1994; Schaub, 1998). These children are described as "engaging in frenzied exploration," unfocused in their efforts, unable to stay with play activities for sustained periods, and noncompliant (Teeter, 1998).

Behaviorally, in preschool, children with ADHD exhibit restless behavior, quick mood changes, temper tantrums, low frustration tolerance, and short attention span (Schaub, 1998). Interestingly, a study found that hyperactive children were not notably different from non-ADHD children during "free play" time, but were significantly different during structured activities (Schliefer et al., 1975). At home, resistance to going to bed results in fewer hours of sleep and increased behavioral problems (Wilens, Spencer, & Biederman, 1995). Across settings, approximately 57% of children with ADHD are also more likely to be involved in accident-related injuries due to their impulsive behaviors (Weiss & Hechtman, 1993).

Socially, young children with ADHD show signs of impaired play, as they engage in fewer play activities, have less functional motor interactions, demonstrate greater difficulty in social exchanges, and begin to experience

rejection (Pelham & Bender, 1982; Teeter, 1998; Weiss & Hechtman, 1986). In structured settings, they may be reluctant to join the group and may disrupt others by intruding on their play or being bossy (Schaub, 1998). The relationship between parents and young children with ADHD, can be frustrating and effortful (Weiss & Hechtman, 1993) as these children are noncompliant and do not respond readily to parental efforts to soothe them, resulting in diminished positive parent-child interactions (Teeter, 1998).

Cognitively, young children with ADHD may demonstrate delays in attention and memory (Teeter, 1998), which may impede their acquisition of academic readiness skills (DuPaul & Stoner, 1994). Additionally, language difficulties are often evident (Schaub, 1998). Though children with ADHD are likely to talk more than normal children, their verbal fluency is diminished, as they are more apt to use pauses, fillers, and poorly organized speech (Barkley, 1998).

Treatment, during the infancy and toddler hood stage, should be centered on building positive child-parent relationships by helping parents develop effective interaction styles to deal with the challenges presented by their children (Teeter, 1991). When the child enters the subsequent preschool stage, treatment should be focused on consistent, firm, limit-setting and prosocial skills for interacting with peers (Teeter, 1991).

Elementary School

When the child with ADHD enters middle childhood, often every developmental domain is affected as academic, behavioral, social, and emotional concerns surface (Batsche & Knoff, 1994; Teeter, 1998; Whalen & Henker, 1991). In elementary school, the demands to pay attention are increased so the behavior of children with ADHD appears to worsen as they attempt to adjust to the structure of the school environment without interventions. It is during the first three years of school when many children with ADHD are initially referred for assessment (Batsche & Knoff, 1994; Schaub, 1998).

Deficits in self-regulation, planning, and inhibition are evident during this stage (Teeter, 1998). Teachers report that these children are fidgety, frequently out of their seat, talkative, bossy, and perform inconsistently (Teeter, 1998; Schaub, 1998). They are often disruptive, inattentive, and distractible, so much so, that as many as 46% may be suspended from school, which is significantly higher than their non-ADHD peers (Barkley, 1990; Barkley et al., 1990).

Children with ADHD have a higher risk of achievement difficulties and are significantly behind in academic performance (Anastopoulos, 1996; Biederman et al., 1991; Weiss & Hechtman, 1986). Approximately 30% of these students may repeat a grade and 30-40% are in special education programs (Barkley, 1998). They have difficulty completing class-work as well as homework (Barkley, 1989; Teeter, 1991; Weiss & Hechtman, 1986). Not

surprisingly, 56% of children with ADHD may need academic tutoring to assist with schoolwork (DuPaul & Stoner, 1994). Disorganization begins to play a role in failing to keep track of homework and materials (Schaub, 1998). Academic problems tend to worsen as a student gets older due to less structured environments, increased responsibility, and increased prevalence of multi-step tasks that require project planning skills.

Estimates indicate that 25% to 41% of students with ADHD are likely to have learning problems or learning disabilities, as many perform below their expected level of achievement based on their intellectual level (Barkley, 1990, 1998; Barkley, DuPaul & McMurray, 1990; Biederman et al., 1991; Leimkuhler, 1994; McGee & Share, 1988; Spreen et al., 1995). Though there is considerable variability, due to how a learning disability is defined, approximately 8-39% of children with ADHD are likely to have a reading disability, 12-30% are likely to have a math disability, and 12-27% are likely to have a spelling disability (Barkley, 1998; Barkley, 1990; see review by Semrud-Clikeman et al., 1992). During the early school years, students with ADHD are often described as emotionally immature and exhibiting poor emotional regulation (Barkley, 1998). They have low frustration tolerance, are emotionally reactive, irritable, excitable, and are sometimes hostile (Barkley, 1998). Depending on the severity of these issues within the school setting, some also meet special education eligibility criteria as Seriously Emotionally Disturbed (SED) (Hoff et al., 2002; Landau &

Burcham, 1995). These students are also at-risk for depression and often have low self-esteem (Hoff et al., 2002).

More than half of students with ADHD have social skills deficits (Anastopoulos, 1996; Barkley, 1990; Frederick & Olmi, 1994; Landau, Milich, & Diener, 1998). At this age, students with ADHD experience social rejection (Barkley, 1989; Landau et al., 1998; Schaub, 1998; Teeter, 1998; Wender, 1987), have negative reputations, and are considered intrusive, bossy, and disruptive (Landau & Burcham, 1995). They have trouble building or maintaining social relationships and resolving conflicts with others (Barkley, 1998). They are awkward in interpersonal situations due to their impulsivity, lack of ability to pick up on social cues, and poor reciprocal interactions. A variety of behavioral excesses and deficits make it difficult to initiate and maintain friendships. Additionally, they have difficulty participating in extracurricular activities (Barkley, 1990). In sum, their social inadequacies lead to fewer social interactions and in turn, fewer opportunities to develop effective social skills.

Not unexpectedly, relationships between individuals with ADHD and adults can also be strained. Interactions between teachers and students with ADHD have been found to be more negative than those among teachers and non-ADHD students (Frederick & Olmi, 1994; Whalen, Henker, & Dotemoto, 1981). At home, the parent-child relationship is also labored as the child fails to comply

with parental requests, does not complete household chores, displays tantrums, and often argues with siblings (Barkley 1990; Schaub, 1998).

During the middle childhood developmental stage, treatment should include a continued focus on social skills, as well as efforts aimed at reducing the potential for learning problems (Teeter, 1991). An emphasis should be on developing organizational skills, problem-solving, and study skills (Teeter, 1991). Furthermore, behavior management techniques and medication should also be addressed to ameliorate academic and social difficulties at this time (Teeter, 1991).

Middle and High School

During adolescence, the core symptoms of the syndrome are no longer the major concern, but the toll that these symptoms have taken comes to the fore. Commonly, the issues facing adolescents with ADHD revolve around the same issues that began to emerge in elementary school--behavior problems, social difficulties, emotional issues, and serious academic challenges. In adolescence, these difficulties are manifested by antisocial acts, poor school performance, discipline problems, and difficult peer relationships (Weiss & Hechtman, 1986, 1993). Additional issues surround emotional immaturity, lack of ambition, inability to maintain goals, and low self-esteem (Spreen et al., 1995). Essentially, ADHD appears to exacerbate many of the issues faced by all adolescents.

Academically, it is not surprising that individuals with ADHD enter adolescence ill-prepared for secondary school due to the many gaps in learning that resulted from their disorder during their elementary school years (Weiss & Hechtman, 1993). Estimates suggest that about 58% of students with ADHD have a history of academic failure (Kendall & Braswell, 1985; Barkley, 1989; Barkley, Fischer et al., 1990; Brown & Borden, 1986) and that by the end of sixth grade, 30-40% receive special education assistance (Barkley, Fischer et al., 1990). Poor study habits become a greater issue at this stage, further exacerbating academic problems. Up to 35% of students with ADHD may drop out of school in contrast to 10% of non-ADHD students (Barkley, 1990; Barkley, Fischer et al. 1990; Weiss & Hechtman, 1986; Wender, 1987).

Rebellious behaviors are more prominent in adolescents with ADHD (Barkley, 1989), as they often have difficulty with listening, complying and adhering to directions (Barkley, 1998; Kendall & Braswell, 1985). Behaviorally, when these students enter middle and high school, they tend to no longer appear hyperactive. They may be fidgety and restless, however, they are more able to minimize the excessive motor movements. They still often look around the classroom and are described as loud. By this point, 60-80% will have been on stimulant medication to help control the symptoms of ADHD (Barkley, Fischer et al., 1990).

Convergence across studies suggests that approximately half of all students with ADHD have diagnosable behavior problems (Barkley, 1990; Landau & Burcham, 1995; Spreen et al., 1995). Specifically, 59% of children with ADHD also meet the diagnostic criteria for Oppositional Defiant Disorder (ODD) and 43% qualify for a diagnosis of Conduct Disorder (CD) (Barkley, DuPaul et al., 1990). These difficulties are characterized by defiance, temper outbursts, irritable mood, and aggression toward adults and/or authority. Those who also demonstrate conduct problems are more difficult to manage and demonstrate more significant adjustment problems (Landau & Burcham, 1995; Weiss & Hechtman, 1986).

About 10% of students with ADHD are involved in juvenile court proceedings by the time they reach adolescence and they are described as four times more violent than peers without ADHD (Barkley, 1998). In adolescence, likelihood of substance abuse is also greater than that of their peers without ADHD, due to the risk-taking behavior of these students (Fergusson, Lynskey, & Horwood, 1997). Truancy, promiscuity, increased number of traffic accidents and other such behaviors are also more common (Leimkuhler, 1994; Blouin, Bornstein, & Trites 1978; Weiss & Hechtman, 1986).

Students with ADHD may also have a co-occurring emotional problem. Research demonstrates that 25% of students with ADHD have a co-occurring anxiety disorder (Pliszka, 1989, 1991). These students often have a lower

frustration tolerance and are described as "high maintenance." They are often emotionally sensitive and suffer from low self-esteem due to repeated failure, misunderstanding, and mislabeling. Depression may also be evident (Hoff et al., 2002). Although some of the behavioral problems associated with ADHD improve with maturity, often times the emotional toll associated with the disorder persists, thereby increasing the risk of psychological disorders as the individual gets older (Garfinkel & Klee, 1985; Leimkhuler, 1994).

Socially, adolescents with ADHD are viewed as immature. Underdeveloped social skills are more evident during this period as the peer group becomes of central importance. They engage in impulsive and reckless behavior, often to improve their popularity (Schaub, 1998). At home there is an increase in family conflicts (Barkley, 1989; Batsche & Knoff, 1994; Wender 1987) which center on issues such as following rules and assuming appropriate responsibilities (Barkley, 1989). On a positive note, although many individuals with ADHD continue to display symptoms of their disorder into adolescence and young adulthood, many have adjusted to their disorder by the time they reach this development stage (Barkley, 1990; Teeter, 1998).

Treatment, during adolescence, needs to continue to focus on academic needs, in addition to improving social reasoning and judgment skills to help students make decisions regarding normal adolescent concerns (e.g., dating, peer pressure, sexual activity, drugs/alcohol) (Teeter, 1991). Communication and

conflict resolution skills also must be improved at this stage (Teeter, 1991).

In the adolescent population, hyperactivity is manifested by restless feelings and minor-motor movement during sedentary activities. During situations that allow for freedom of movement, adolescents with ADHD are often overly active, as they interrupt talk, are intrusive with peer interactions, and bump into people and things. (Wender, 1995). Most commonly, adolescents with ADHD demonstrate academic problems, a difficulty that increases with age (Fischer, Barkley, Edelbrock, et al., 1990). These problems are typically: failure to complete work, careless mistakes, not listening or following directions in the classroom (Wender, 1995). Additionally, they laugh excessively and inappropriately, become overly excited, fool around without regard to the feelings of others, and overreact to interactions with others, thereby often labeling them as immature (Wender, 1995). A high percentage of these students also display oppositional behaviors and are manifested in adolescence as disobedience, talking back, frequent fighting, and low frustration tolerance, drug and alcohol abuse and encounters with the law (Wender, 1995).

Fifty percent or more of adolescents with ADHD will have at least a moderate improvement in response to stimulant medication (Wender, 1995). For those who fail to respond to the stimulants, the second choice is the tricyclic antidepressants, however cardiac effects and risk of suicide must be carefully considered. Behavioral management of the adolescent with ADHD should focus

on the loss of privileges or assignment of special duties/chores (Wender, 1995). The following interventions are considered helpful to adolescents with ADHD: 1) improved communication; use of behavioral contracts; family therapy; organizational skills assistance; and frequent incentives and reinforcement to persist with tasks they find boring or repetitive (Wender, 1995).

Post-secondary

A large percentage of individuals with ADHD (30-50%) continue to have symptoms into adulthood (Barkley, 1990; 1997), affecting approximately 10 million adults in America (Schaub, 1998). Though the characteristics of the disorder may manifest themselves differently at this stage, adults with ADHD have difficulty with achievement, organization, patience, and frustration tolerance (Schaub, 1998). Only about 5% of individuals with ADHD complete a university degree compared to 41% of their non-ADHD peers (Barkley, 1990). Though employment options are sometimes limited as a result, often these individuals settle into jobs that allow them freedom and multiple options to reach their potential (Schaub, 1998). Approximately 79% complain of psychiatric and/or psychological problems such as sadness and/or anxiety, which often translate into problems on the job and with relationships (Weiss & Hechtman, 1986). By the time they reach early adulthood, they are at higher risk for difficulties such as job dismissals, poor conduct ratings, infractions with the law, and incarcerations (Parker & Asher, 1987; Schaub, 1998).

Etiology

Diverse etiologies have been previously proposed for ADHD, including: mother's health, mother's drug/alcohol use, fetal development, and birth traumas (Spreen et al., 1995; Barkley, 1998). Additionally, environmental factors such as: sugar/additives, lead poisoning, radiation exposure, family size, and social disadvantage (Spreen et al., 1995; Anastopoulos & Barkley, 1992) have been suggested. While the aforementioned factors may result in ADHD-like symptoms, they are not likely to account for the majority of ADHD cases (Barkley, 1998; Rutter, 1982).

Rather, recent research indicates that heredity seems to account for the largest number of cases of ADHD, as it has been found to exist in greater frequency among first-degree biological relatives (American Psychiatric Association, 1994; Barkley, 1998; Gjone et al., 1999; McMahon, 1980). Early research studies demonstrated significantly high concordance rates of ADHD among twins (approximately 60%), and even higher rates among those that were monozygotic (approximately 92%) (McMahon, 1980). More recent data have demonstrated greater support. A study of more than 500 identical twins indicated that 80% of the differences in inattention, hyperactivity, and impulsivity could be explained by genetic factors (Gjone, Sundet, & Stevenson, 1999). Additionally, siblings of children with ADHD are five to seven times more likely to develop

ADHD (Barkley, 1999) and children of parents with ADHD have a 50% chance of developing ADHD (Barkley, 1990).

During the past few decades, both neuroanatomical and neurochemical abnormalities have been investigated, in addition to the aforementioned genetic factors (Anastopoulos & Barkley, 1992; Barkley, 1998; Heilman, Voeller, & Nadeau, 1991; Quinn, 1995; Semrud-Clikeman et al., 1994), resulting in a view that ADHD is neurodevelopmental in origin. However, as of yet, no single deficit has been found to explain all the symptoms of ADHD. Additionally, much of this research is correlational in nature which, of course, does not imply causation (Barkley, 1998).

Neurochemical

Of the 30 or so recognized neurotransmitters, (chemicals that serve to transmit nerve impulses in the brain), a certain few have been linked in ADHD, namely norepinephrine and dopamine (Hechtman, 1994; Ricco, Hynd, Cohen, & Gonzales, 1993). Technology has been successfully utilized to not only link neurotransmitters with their specific functions, but also to map their release and depletion within specific areas of the brain, which allows inferences to be drawn that connect an overabundance or deficit of a specific neurotransmitter with symptoms.

One theory espouses that hyperactivity is a result of an imbalance in the arousal system that is mediated by neurotransmitters, which results in impaired

inhibition in the central nervous system (McCraken, 1991; Quinn, 1995; Wender, 1981). The deficit of norepinephrine in the pathways that maintain alertness, particularly in the posterior attention system of the right hemisphere of the brain has been found among those with ADHD (Posner & Peterson, 1988). Research has also implicated dopaminergic activity (Rogeness, Maas, Javors, & Macedo, 1989) as evidenced from cerebral-spinal fluid studies with children that showed decreased dopamine (Raskin, Shaywitz, Shaywitz, Anderson, & Cohen, 1984) and studies demonstrating the overactivity of the dopamine circuit (Castellanos, 1997). While evidence for a deficiency of both dopamine and norepinephrine seems to exist (Barkley, 1998), due to the complexity of the neurochemical systems, ADHD cannot presently be linked exclusively to one neurotransmitter (Quinn, 1995; Zametkin & Rapoport, 1987a, 1987b).

The rate at which the brain uses glucose (its main energy source), has also been shown to be lower in persons with ADHD, especially in the portion of the brain that is responsible for attention, motor control and inhibition responses (Lou, Henriksen, Bruhn, Borner, & Nielsen, 1989; Ricco et al., 1993; Zametkin et al., 1990). A significant correlation between decreased glucose metabolism in the left frontal region of the brain and ADHD symptoms, suggests a link between brain activity and behavior (Zametkin et al., 1990). Reduced glucose utilization has also been found in the frontal lobes among adults with ADHD (Quinn, 1995; Zametkin et al., 1990) particularly in the premotor cortex and the superior

prefrontal cortex in the left hemisphere (Quinn, 1995). Results of follow-up studies with adolescents (Ernst et al., 1994; Zametkin et al., 1990) were inconsistent (Barkley, 1998).

Neuroanatomical

In addition to the neurochemical findings, researchers have identified relationships between specific behavior problems among individuals with ADHD and neurological structures (Hechtman, 1994; Quinn, 1995; Ricco et al., 1993; Semrud-Clikeman et al., 1994). Recent research studies have used technology such as CT scans (coaxial tomography), PET scans (positron-emission tomography), and MRI (magnetic resonance imaging) to identify anatomical brain differences. Differences in four main areas have been found, including the frontal lobes, the basal ganglia, the cerebellum, and the corpus callosum.

The frontal lobes of the brain can be considered the "CEO" of the brain, responsible for organization, regulation of behavior, and planning. "The task of the frontal lobe is to handle sequentially received information, to integrate current experience with past experience, to monitor present behavior, to inhibit inappropriate responses, and to organize and plan for the attainment of future goals, usually referred to as the *executive function*.." (Quinn, 1995, p. 22).

Research has demonstrated that the frontal lobes of the brain in individuals with ADHD are smaller than that of controls (Becker, Issac, & Hynd, 1987), particularly in the right frontal region (Hynd, Semrud-Clikeman, Lorys, Novey, &

Eliopulos 1990). Additionally, cerebral blood flow studies have consistently demonstrated less blood flow, or hypofusion, to the central areas of the frontal lobes among individuals with ADHD (Lou et al., 1989).

Behavioral patterns and tests of frontal lobe activity support this theory of frontal lobe deficits (Boucugnani & Jones, 1989). Specifically, studies utilizing neuropsychological tests have demonstrated that difficulties with working memory, planning, verbal fluency, perseveration, and motor sequencing are among frontal lobe functions that are implicated with behavioral disinhibition (Barkley, 1997a, 1998).

Culling this neurological and neuropsychological research, it has been found that patients with focal hemispheric lesions on the right side of the brain demonstrate impaired attention, arousal, and motor activation (Heilman et al., 1991). Similarly, patients with frontal lobe lesions demonstrate defective response inhibition similar to that found among people with ADHD, again demonstrating a connection between attention, impulsivity, and frontal lobe functions (Ricco et al., 1993; Semrud-Clikeman et al., 1999)

An area of the brain that assists in suppressing automatic responses in order to allow more deliberation by other areas of the brain is called the basal ganglia and it has also been implicated in children with ADHD (Castellanos, Giedd, Marsh et al., 1996). Particularly, the caudate nucleus, within the basal ganglia, has been investigated. The caudate has been found to be critical in motor

regulation and behavioral inhibition (Ricco et al., 1993). Studies demonstrate decreased blood flow and metabolism in the right side (Lou et al., 1989). Additionally, studies have demonstrated that the typical "right greater than left" differences in the caudate appear to be absent in children with ADHD, indicating a smaller caudate nucleus among students with ADHD (Ricco et al., 1993).

The part of the brain that is involved in "editing" one's own behavior and resisting distractions is the prefrontal cortex of the cerebellum and it has been found to be smaller in children with ADHD (Hynd et al., 1990). Specifically, the area that is involved in regulating motivation (the vermis area of the cerebellum) has also been found to be smaller in children with ADHD (Hynd et al., 1990).

Differences in the corpus callosum among children with ADHD have also been documented (Giedd et al., 1994; Hynd, et al., 1990; Hynd, Semrud-Clikeman, Lorys, Novey, Eliopulos, & Lyytinen, 1991; Semrud-Clikeman et al., 1994). The corpus callosum is one of the main commisures of the brain that interconnects, via millions of myelinated fibers, cortical regions of one hemisphere to similar regions of the opposite hemisphere.

It is suggested that abnormalities in a given area of the corpus callosum may be reflective of abnormalities in the corresponding region of the brain (Ricco et al., 1993). Studies have found a smaller corpus callosum among subjects with ADHD, particularly in the areas of the genu (Hynd et al.,1991), the splenium (Hynd et al., 1991) and the rostrum and rostral body regions (Giedd et al., 1994),

which are believed to loosely correspond to brain regions responsible for self-regulation, sustained attention, and impulsivity, respectively. In contrast, other studies have failed to find differences between the corpus callosum of those with ADHD and control subjects (Castellanos et al.,1994; Castellanos et al., 1996), suggesting that differences may be due to learning disabilities rather than ADHD.

New conceptualizations are focused on the neurophysiological basis of ADHD, which incorporates both the neurochemical and neuroanatomical perspectives (Ricco et al., 1993). This view links brain pathways with the corresponding brain regions and highlights dysfunction within these systems, however, empirical support is just emerging (Ricco et al., 1993). More recent etiological research has investigated genes and DNA as relates to ADHD. Findings so far have implicated two specific genes (which are very active in the prefrontal cortex and the basal ganglia) (Smalley, 2000). It is optimistically hypothesized that the identification of the specific genes that relate to ADHD will be confirmed over the next five years (Smalley, 2000).

Treatment Options

The complexities that surround the diagnosis and etiology of ADHD also are reflected in the treatment of the disorder. The clinical management of this disorder often requires several therapeutic interventions in combination, as it is unlikely that a single approach will address the multitude of difficulties that these individuals face (Anastopoulos, 1996). The discussion of treatment that follows

addresses medication, as well as, non-medication treatment options aimed at the family system and the school system. A discussion of combined treatments concludes the section.

Though medication therapy is by far the most common treatment used for individuals with ADHD, there are substantial reasons that warrant the use of other treatment options, including: (a) medications do not alleviate learned behavior; (b) some children do not respond well to medication; and (c) some parents are opposed to medication management for their children (Barkley, 1998). As stated earlier, a significant percentage of children with ADHD develop a comorbid behavior disorder (Barkley, 1989, 1998) which is viewed as being learned, and therefore, capable of being improved via behavioral interventions, not medication (Barkley, 1989). Even when children are treated with medication, there are times when they are not deriving any benefit from the medication (e.g., during holiday medication breaks and after the last dose of the day has worn off) and the parents may need strategies for managing their children's behavior during these times (Barkley, 1989,1998; Dubey, O'Leary, & Kaufman, 1983). Furthermore, an estimated 10-20% of children do not demonstrate any improvements in their ADHD symptoms with medication (Barkley, 1998; Dubey et al., 1983), thereby making it necessary to pursue other treatment alternatives.

Medication

Medication management for ADHD began more than 50 years ago (Barkley, 1990, 1998; Flick, 1998; Zametkin & Rapoport, 1987a) and continues to receive considerable attention (Hoff et al., 2002), as methylphenidate use in students more than doubled between 1990 and 1995 (Safer & Zito, 1996). To keep up with this demand, the production of methylphenidate has tripled over a 10 year period (Greenhill, 1998). Estimates indicate that 2.8 % (or 1.5 million) of children aged 5 to 18 are prescribed methylphenidate (Safer et al., 1996). This increase, though controversial, appears to be attributed to increased length of time students are receiving treatment, additional girls and adolescents on the medication, and an improved public view of medication as a treatment option (Safer & Zito, 1996).

Though stimulants are the most commonly prescribed psychotropic drugs for children with ADHD, other classes of drugs also have demonstrated utility, including the antidepressants and the antihypertensive medications. New classes of medications are also being investigated for their potential utility with ADHD symptoms, including selective serotonin re-uptake inhibitors (SSRIs), anticonvulsants, and antipsychotics. Discussion of the multitude of dosing options, recommended ranges, and potential side effects is beyond the scope of this review.

Stimulants

The stimulant medications, (also referred to as the Central Nervous System (CNS) stimulants, or the psychostimulants), are the most commonly prescribed class of medications to treat ADHD and are often the first choice of physicians. It is estimated that approximately 3% (Safer & Zito, 1996) to 7% (Davila, Williams, & MacDonald, 1991) of the school-age population in the United States is being prescribed stimulant medication.

Stimulant medications have been highly effective in the management of ADHD (Anastopoulos & Barkley, 1992; Barkley, 1990; DuPaul, Barkley & Connor, 1998; Whalen & Henker, 1991). Approximately 70% of students with ADHD respond positively to stimulant treatment, as evidenced by over 170 controlled studies involving more than 6,000 school-age children (Spencer et al., 1996). Three-fourths of children with ADHD treated with stimulants show behavioral improvements, as the medication helps reduce: inattention, time off-task, noncompliance, disruptive behavior, motor movement (e.g., fidgeting, finger tapping, restlessness), impulsivity, (e.g., interrupting, blurting out), and emotional outbursts (e.g., negative or aggressive behavior) (Barkley, 1998; Goldstein 1992; Spencer et al., 1996).

The stimulants commonly used to treat ADHD are methylphenidate (Ritalin), dextroamphetamine (Dexedrine), pemoline (Cylert), amphetamine/dextroamphetamine (Adderall), and the newly introduced

methylphenidate HCL (Concerta) (Barkley, 1990; DuPaul et al., 1998; Henker & Whalen, 1989). Though the effects that the stimulants have on brain functioning varies as each drug may have a different mode of action (Wilens et al., 1995), generally stimulants appear to work on the neurochemical pathways in the brain that involve the release of both dopamine and norepinephrine (DuPaul et al., 1998; Pliszka 1989). These medications appear to block the reuptake of dopamine and norepinephrine into the presynaptic neurons in the brain and concurrently increase the release of these neurotransmitters into the extraneuronal space (Elia et al., 1990; Zametkin & Rapoport, 1987a). Though the precise mechanisms that enable these medications to work is not well understood, their effect on ADHD symptomatology is evident.

Common side effects of the stimulants include: loss of appetite, insomnia, temporary growth suppression, irritability as medication wears off, headache, stomachache, vocal tics, and motor tics (Spencer et al., 1996). The greater the dosage, the greater the side effects, however, the side effects are temporary and often subside after a few weeks of treatment. All side effects cease when the medication is discontinued. Data indicate that there are no enduring benefits once medication treatment has ended (Weiss & Hechtman, 1993). This suggests that although there are multiple short-term benefits to stimulant treatment, it is unlikely that stimulant medication alone will provide permanent gains.

Antidepressants

Since approximately 30% of individuals with ADHD do not respond positively to stimulant medication (Wilens et al., 1995), other pharmacological options are utilized. Tricyclic antidepressants (TCAs), such as imipramine (Tofranil), desipramine (Norpramin), amytiptyline (Elavil), and nortriptyline (Palemor) are typically prescribed when contraindications to the psychostimulants are noted (e.g., motor tics) or when a co-occurring mood disturbance is evident (Spencer, Biederman, & Wilens, 1998).

A review indicates that there have been more than 30 studies, with over 1000 children, on the use of tricyclic antidepressants with individuals with ADHD. The majority of these studies (87%) demonstrate significant improvement in ADHD symptomatology (Spencer et al., 1998). Specifically, these antidepressants have been shown to increase vigilance (Anastopoulos & Barkley, 1992), decrease impulsivity (Anastopoulos & Barkley, 1992), and decrease aggressive behavior (Barkley, 1998), as well as improve mood difficulties (Spencer et al., 1998), including reductions in depressive symptoms and anxiety (Biederman, Baldessarini, Wright, Keenan, & Faraone, 1993). Neurochemically, the tricyclic antidepressants most likely demonstrate effects on norepinephrine (Leimkuhler, 1994) and serotonin (Hechtman, 1994; Spencer et al., 1998).

Another medication that has demonstrated utility with children with

ADHD is bupropion (Wellbutrin), which is classified as an atypical antidepressant (Conners et al., 1996; Wilens et al., 1995). Bupropion seems to impact both dopamine and norepinephrine (Spencer et al., 1998) and has been reported to reduce aggressive and hyperactive symptoms, as well as depression (Spencer et al., 1996). However, it is associated with a higher risk of drug-induced seizures, especially when administered in higher doses, therefore it is more often prescribed to adolescents or adults, rather than children (Spencer et al., 1996). Avoiding risk factors (e.g., history of seizures, eating disorders, high doses) and dividing the daily dosage decreases the risk for seizures to that of the other antidepressants (Spencer et al., 1998).

The monoamine oxidase inhibitors (MAOI), have also demonstrated effectiveness in the treatment of ADHD (Spencer et al., 1998), however due to the potentially serious side effects with certain foods, their use is severely restricted with children (Spencer et al., 1998).

Venlafaxine (Effexor), is in the class of novel antidepressants, as it impacts both serotonin and norepinephrine. It has also demonstrated some utility with students with ADHD. Side effects of venlafaxine are most apparent during the initiation of treatment and include nausea, anxiety, and insomnia and as treatment progresses, the side effects are similar to those of the SSRIs (Sokolenko & Kutcher, 1999; see side effects of SSRIs below).

Generally, the side effects of the antidepressants are somewhat more serious than those of the stimulants so, as with all medication, the risk/benefit ratio needs to be considered prior to treatment, especially with children. Side effects include: dry mouth, drowsiness, constipation, flushing, and cardiac effects (Spencer et al., 1998). Fortunately, these side effects are not permanent. Additionally, with the antidepressants, the therapeutic effect decreases over time, which means that the dosage needs to be increased the longer the individual is on the medication.

Antihypertensives

Research of antihypertensive medications, which are traditionally used to treat high blood pressure, has demonstrated some success for the treatment of ADHD in children, (Connor & Swanson, 1999; Hunt, Arnsten & Asbell, 1995; Wilens et al., 1995). Among the antihypertensives used are guanfacine (Tenex) and clonidine (Catapres), the latter of which is the more prevalent of the two. A review of the literature reports 39 studies (Connor, 1998), 10 of which are controlled studies (Connor & Swanson, 1999), researching the use of clonidine with children and/or adolescents with ADHD. Results of these studies demonstrate that clonidine decreases aggression, overarousal, hyperactivity, impulsivity, and sleep disturbances, however, there is little improvement on attention and cognitive symptoms (Connor, 1998). This medication has also demonstrated utility for tic disorders which often co-occur with ADHD (Connor,

1998; Connor & Swanson, 1999). Between 1990 and 1994 there was a five-fold increase in the prescription of clonidine for ADHD (Connor & Swanson, 1999). Noteworthy, is that 40% of individuals prescribed clonidine, for ADHD were also prescribed a stimulant (Connor & Swanson, 1999). It is believed that clonidine affects the neurotransmitter, norepinephrine (Connor & Swanson, 1999).

The side effects of the antihypertensives can be somewhat serious including: drowsiness, dizziness, sedation, weakness, sleep disturbances, and cardiac effects (Connor & Swanson, 1999). It is noteworthy that four unexplained deaths have occurred in children prescribed a combination of clonidine and methylphenidate, which prompted further investigation by the Food and Drug Administration (FDA) and researchers, which concluded that there was insufficient data to warrant discontinuation of the combination (Connor & Swanson, 1999).

There are no controlled studies of the use of guanfacine with children with ADHD yet, results of three clinical trials have shown improved parent ratings of hyperactivity, inattention, and immaturity (Connor & Swanson, 1999; Hunt, et al., 1995). Guanfacine impacts the central nervous system differently than clonidine but it is suspected to more specifically act upon systems related to the etiology of ADHD (Connor & Swanson, 1999). The side effects of guanfacine appear to be more mild than those associated with clonidine and subside within a shorter period (Hunt et al., 1995).

SSRIs

Clinical research is also being conducted on other classes of medications to evaluate their effectiveness in treating ADHD. In recent years, the selective serotonin reuptake inhibitors (SSRIs) have been successfully utilized for a variety of disorders. Among these are fluoxetine (Prozac), sertraline (Zoloft) and paroxetine (Paxil). Generally, results thus far indicate that while these medications are invaluable in treating concurrent anxiety, depression, and obsessive-compulsive disorders, their utility with ADHD is unclear. Though it has been stated that the SSRIs have little, if any, impact on the core ADHD symptoms (Wilens et al., 1995) one study investigating Prozac with a sample of children with ADHD demonstrated a moderate improvement (Spencer et al., 1996).

Anticonvulsants

Anticonvulsants have been used with children with behavior disorders for some time (Connor, 1998). Carbamazepine (Tegretol) has received the most support for treating behavioral disorders. A review of 10 studies, including 3 controlled studies, suggested some benefit with regard to improving overarousal, aggression, impulsivity, hyperactivity, restlessness, and excitability in children and adolescents with ADHD, in the absence of neurological abnormalities (Connor, 1998).

Divalproex sodium (Depakote) is another anticonvulsant used to manage aggression in children, however its side effects are significant (Well-Connected Group, 2002).

Antipsychotics

In the past, children with ADHD with comorbid Tourette syndrome or tic disorders may have been prescribed antipsychotics such as thioridazine (Mellaril), chlorpromazine (Thorazine), and haloperidol (Haldol) (Green, 1995). The new atypical antipsychotics including risperidone (Risperdal), clozapine (Clozaril), and olanzapine (Zyprexa) and quetiapine (Seroquel) have not yet been well researched for the use with behavior disorders and ADHD in children (Connor, 1998). A recent preliminary study indicated that risperidone was very helpful to two-thirds of patients with severe ADHD, and those with oppositional defiant disorder, who did not benefit from all other medications or behavior treatment (Well-Connected Group, 2002). However, antipsychotic medications possess the potential for serious side effects, particularly neurological ones, so their use with children with ADHD has been cautioned (Connor, 1998).

Combined pharmacotherapy for ADHD has become more common, and emerging results are positive (Connor, 1998). For example, a pilot study was conducted in which groups of students with ADHD and either conduct disorder or oppositional defiant disorder were administered methylphenidate alone, clonidine alone, or a combination of both. Results demonstrated that clonidine alone or in

combination with methylphenidate was effective in treating ADHD and aggressive behavioral disorders (Connor, 2000). Further review of these studies is beyond the scope of this discussion (see Spencer et al., 1996 for a review).

Family-based Treatment

Family-based treatment options employ the parents and the family system as primary change agents for children with ADHD. These interventions may include family therapy and parent training. Overall, findings have been equivocal in ameliorating symptoms of ADHD, however these methods have demonstrated effectiveness in improving associated difficulties.

Family therapy focuses on assisting families improve interaction skills with regard to problem solving, communication, and conflict resolution (Bloomquist, 1996). A series of studies of family training involving families with adolescents with ADHD demonstrated reductions in family conflict and improvement in family interaction skills (Robin & Foster, 1989) however, minimal improvements in ADHD symptoms were noted.

Parent education programs are often based on the premise that current problems exist with children because parents lack knowledge and/or skill in parenting. It is then assumed that with new knowledge and skills, parents will change their behavior and, in turn, the child will change his or her behavior. Parent training, particularly parent training based in behavior modification procedures, has been found to be beneficial for families with children with ADHD

(Anastopolous & Barkley, 1992; Anastopoulos, Shelton, DuPaul, & Guevremont, 1993; Barkley, 1990, 1997; Dubey et al.,1983; DuPaul & Stoner, 1994; Fine & Jennings, 1992; Horn, Ialongo, Popovich, & Perdotto, 1987; Newby, Fischer, & Roman, 1991; Strayhorn & Weiderman, 1989). Behavioral parent training aims to restructure the demands that parents pose to their children by implementing environmental contingencies that will affect the child's motivation for improved work, rule governed behavior, and compliance (Barkley, 1998).

Parent training has been found to improve parent-child relationships as well as to, reduce noncompliant, rule-violating, and aggressive behavior in children, particularly with preschoool and elementary school children (Barkley, 1997; Bloomquist, 1996; Hinshaw & Erhardt, 1993; McMahon, 1980; Webster-Stratton, 1993). Positive effects have also been found on parents through reduced stress and improved self-esteem (Anastopoulous et al., 1993).

Barkley (1997) developed a training program specifically for parents of children with ADHD, ages 2 to 11, that aims to educate parents about the disorder and help them acquire skills to manage misbehavior (Barkley, 1990, 1997). For older individuals with ADHD, a promising approach is a program that involves training parents and their adolescent child on problem-solving steps to manage challenges often associated with the teen-age years (Robin & Foster, 1989).

School-based Treatment

Treatment offered within the school environment for students with ADHD focus on ameliorating behavioral, emotional, or social difficulties. These methods are varied and plentiful and can include special programming, classroom modifications, social skills training, and forms of self-management training.

Mandated Services

Concerns surrounding the education of students with ADHD resulted in the United States Congress directing the Department of Education to issue a "Notice of Inquiry" in November 1990, which invited the public to provide input regarding the services in existence to address the needs of students with ADHD and to establish centers to manage the synthesis and dissemination of knowledge about ADHD (Hocutt, McKinney, & Montague, 1993; Kallas et al., 1997). The concerns that surfaced resulted in the issuance of a policy memorandum in 1991 that clarified the schools' legal responsibilities to provide services to students with ADHD (Davila et al., 1991). Specifically, this memorandum noted that students with ADHD could be eligible for special education services under the Individuals with Disabilities Education Act (IDEA) (Hakola, 1992) or Section 504 of the Rehabilitation Act of 1973 (Davila et al., 1991), which has brought ADHD, previously considered to be solely a medical issue, to the forefront in the schools.

In 1997, the amendments to IDEA, and the subsequent 1999 regulations, explicitly stated that ADHD falls under the list of possible health concerns that may make a student eligible for services under the Other Health Impaired (OHI) category, thereby making it clear that students with ADHD are eligible for special education services (Hoff et al., 2002). Notably, the OHI category is the fastest growing special education category, as it has increased 280% over the past decade, most likely due to the increase in identification of students with ADHD for special education services (U.S. Department of Education, 1999).

Academic Interventions

Students with ADHD are at higher risk for academic failure, which highlights the need for academic interventions (DuPaul & Stoner, 1994). Curriculum modification is an academic intervention commonly used to improve the school performance of students with ADHD by making changes to the delivery or content of material prior to it being presented to the student (DuPaul & Eckert, 1998). In addition to ensuring that the curriculum material matches the appropriate instructional level of the individual student (DuPaul et al., 2002) additional modifications include: allowing students choices, increasing the structure of activities, allowing oral responding, and other individualized modifications. Research demonstrates short-term effectiveness of these types of interventions with regard to decreasing disruptive behavior, increasing task engagement, and increasing academic performance (DuPaul & Eckert, 1998).

Improved on-task behavior and increased work productivity have also been noted when students are allowed to make controlled choices over assignments (Dunlap et al., 1994; DuPaul et al., 2002).

Peer tutoring, defined as "any instructional strategy wherein two students work together on an academic activity, with one student providing assistance, instruction, and feedback to the other," (DuPaul & Eckert, 1998, p. 61) is another academic intervention that has been researched for its effectiveness with students with ADHD. This method is considered favorable due to the following components: (a) one-on-one instruction, (b) instructional pace determined by the student with ADHD, (c) frequent prompting of academic responses, and (d) frequent and immediate feedback regarding performance (Barkley, 1998; Pfiffner & Barkley, 1990). Studies of peer tutoring have produced short-term improvement of the active engagement and academic performance of students with ADHD (DuPaul & Eckert, 1998; DuPaul et al., 2002).

Computer assisted instruction has also been investigated with students with ADHD in an attempt to increase their focus on academic tasks (DuPaul & Eckert, 1998). Positive characteristics of this method include: (a) presentation of specific objectives, (b) special print/highlighting of essential material, (c) multiple sensory modalities, (d) division of content into smaller units, and (e) immediate feedback to responses (DuPaul & Eckert, 1998; DuPaul et al., 2002). Though few empirical studies have investigated the effectiveness of computer assisted

instruction, results are promising in that some students demonstrated improved work completion and increased attending behaviors (DuPaul & Eckert, 1998; DuPaul et al., 2002).

Social Skills Training

Students with ADHD often have poor relationships with peers and engage in other antisocial acts such as lying, stealing, and fighting (Barkley, 1990; Landau et al., 1998), which highlights the need for effective social skills intervention (Frederick & Olmi, 1994). Social skills training has generally focused on decreasing aggression and increasing prosocial behavior, such as expression of emotions, sharing, cooperation and initiation of appropriate social interactions and (Bloomquist, 1996).

Students with ADHD are not likely to catch on to teacher cues and consequently are among the least likely to follow classroom rules. Therefore, teaching students with disruptive behavior the school and/or classroom rules is potentially a worthwhile prosocial strategy (DuPaul et al., 2002). Specifically, the following methods should be employed: (a) reminding students of rules, (b) pointing out children as examples of following rules, (c) maintaining eye contact during instruction, (d) frequent circulation throughout the classroom, (e)nonverbal cues and signals to redirect students, (f) established routines, and (g) clear expectations about use of class time (DuPaul et al., 2002).

Although outcome studies of the effectiveness of social skills programs are limited, there is some agreement that these programs should include: instructions and rationales, modeling, concept teaching, role playing/behavioral rehearsal, practice, coaching, and contingent reinforcement (Rhode, Jenson, & Reavis, 1995). Furthermore, it has been found that these methods are effective only to the degree that they are coupled with contingency management procedures, such as praise and consequences (Hoza, 2001).

Since children with ADHD often respond quickly and inaccurately to social situations (Barkley, 1990), social problem-solving emerged as a method to teach children how to solve problems in a systematic manner (Ervin, Bankert, & DuPaul, 1996). The steps generally include: (1) What is the problem?; (2) Who or what caused the problem?; (3) What does each person think and feel?; (4) What are some plans to solve the problems?; (5) What is the best plan?; (6) Do the plan; (7) Did the plan work? (Bloomquist, 1996). Research on this method demonstrates that though the student can learn the steps, they do not often use them in settings other than the training sessions (Ervin et al., 1996).

Behavioral Interventions

Behavior management for students with ADHD has long been investigated. Research has demonstrated that behavioral methods can effectively remediate aspects of attention disorders (Anastopoulos & Barkley, 1992; Barkley,

1990; Dawson, 1995; DuPaul & Eckert, 1997; DuPaul & Stoner, 1994; Ervin et al., 1996).

Specifically, the common methods (e.g., token reinforcement programs; contingency contracting; response cost; time-out; and home-based contingencies) aim to improve on-task behavior, task completion, compliance, and impulse control (Ervin et al., 1996; Fiore, Becker, & Nero, 1993). However, results have been equivocal as to whether or not the demonstrated gains generalize to the natural environment (Anastopoulos & Barkley, 1992). Mild reprimands, punishment or time-out, have been found to decrease off-task behavior for some children but it is important to ensure that environment from which the child is being removed, is reinforcing, or behavior difficulties may increase (DuPaul et al., 2002). Response cost, which employs a combination of positive reinforcement and punishment, has been found to be successful in improving attention, on-task behavior, and completion of academic tasks (Barkley, 1998). More recent research has demonstrated that students with ADHD performed similar to non-ADHD peers in a low-interest task when positive reinforcement and response cost were utilized, with response cost being clearly superior to positive reinforcement (Carlson & Tamm, 2000). These results, in addition to others, indicate that response cost may be effective in the classroom for students with ADHD (DuPaul et al., 2002).

To increase the effectiveness of behavior management systems, Barkley (1993) delineates the following guidelines for implementing incentive systems: (a) ensure that reinforcers are administered immediately and frequently, (b) build variety into the reinforcement system, (c) assume that whatever system is designed will require adjustments, and (d) involve the student in helping design the incentive system.

Cognitive-Behavioral Interventions

For the past 20 years, various cognitive-behavioral techniques have been utilized to decrease ADHD symptomatology (Anastopoulos & Barkley, 1992; Fiore et al., 1993). Generally, cognitive-behavioral interventions aim toward teaching the student self-regulation strategies to learn to control their behavior. Methods that have been utilized with students with ADHD include self-monitoring, self-instruction, and self-evaluation (Dawson, 1995; DuPaul & Stoner, 1994). These methods often focus on increasing organizational skills and improving compliance with rules and instructions (Anastopoulos & Barkley, 1992). However, research has demonstrated that cognitive-behavioral strategies are only minimally successful at improving the classroom behavior of students with ADHD (DuPaul & Eckert, 1997; Hoza, 2001) and are not yet as scientifically supported as the behavioral methods and psychostimulant therapies (DuPaul & Eckert, 1997; Ervin et al., 1996; Whalen & Henker, 1991).

Founded on the notion that children learn to modify their behavior by internalizing the directives of adults (i.e., self-guiding speech), self-instruction training, based in part on the work of Braswell and Bloomquist (1991) aims to teach children with ADHD how talk to themselves in order to improve their ability to control their inattentive and impulsive behavior (Barkley, 1997; Ervin et al., 1996). First, a trainer models the task while stating the steps aloud, then the child is then asked to complete the task while stating the steps aloud, then the child is encouraged to complete the task while whispering the steps, and finally the child does the task while just thinking through the steps (Ervin et al.,1996). Though early studies demonstrated some promise (Whalen, Henker & Hinshaw, 1985), later studies have been less favorable and indicate minimal usefulness in the treatment of ADHD in the absence of other methods (Barkley, 1997; DuPaul & Eckert, 1997) primarily due to poor generalization from the training situation.

Self-monitoring is a method in which children are taught to observe and record his or her own behavior. Its utility is based in part on the realization that children with ADHD often do not attend to their own behavior and its consequences (Barkley, 1990). Prompted by a visual or auditory stimulus, the child is instructed to record their behavior during the signaled time period and to note whether or not they were on task. Though this method has not been studied for its effectiveness with children with ADHD (DuPaul & Stoner, 1994), the results with non-ADHD children are promising. Specifically, research has

demonstrated improvement in attention (Barkley, Copeland, & Sivage, 1980), on-task behavior, and academic productivity (Whalen & Henker, 1991), particularly when coupled with methods of reinforcement. When coupled with self-reinforcement it has also demonstrated improvement in peer relations (Whalen & Henker, 1991).

Self-evaluation is one of the more successful of the contingency management strategies for ADHD (DuPaul & Stoner, 1994). In an attempt to shift responsibility of monitoring student behavior from parents and teachers to the student with ADHD, this method trains students to carefully evaluate their behavior and to reward themselves when they reach specified quality standards (DuPaul et al., 2002; Ervin et al., 1996). This method begins with a reinforcement program based on others' ratings of student behavior during a designated period, ranging from 0 to 6. Once gains are exhibited, the student is trained to evaluate his/her own behavior based on the same six point criteria previously used. Points are earned when the student's self-rating match the adult's rating of behavior and are exchanged for reinforcers. Gradually, the adult ratings are phased out. This method has demonstrated behavioral improvements among students with ADHD in regular and resource classrooms (Whalen & Henker, 1991).

Consultation

In order to aid school personnel with the complexities of treating students with ADHD, psychologists may provide consultation services (DuPaul et al., 2002). Specifically, it is suggested that consultants arrange behavior management training sessions, monitor classroom management plans, provide teacher support to reduce the pressures associated with working with demanding children, provide information on stress management techniques for teachers, and provide extensive literature on the topic of ADHD (Teeter, 1991).

Psychologists can serve as consultants to parents in much the same way as they serve as consultants to school personnel. Teeter (1991) suggests providing parents of children with ADHD with literature on the nature, characteristics, and developmental outcome of ADHD. Additionally, parents should be informed of their child's educational rights and of effective intervention techniques available. Consultants should also be able to refer parents to physicians and/or psychiatrists when needed, as well as other community support services

Combined Treatment

Individuals with ADHD have difficulties that cross over into multiple domains of functioning. The aforementioned treatment strategies are not curative of ADHD. Rather they are methods that reduce the symptoms of ADHD and related behavioral and emotional problems. Furthermore, with the cessation of treatment, ADHD symptoms often return to pre-treatment levels (Anastopoulos &

Barkley, 1992; Pelham, Wheeler & Chronis, 1998). Since it is unlikely for a single intervention alone to demonstrate clinically significant, long-term benefits in the treatment of ADHD, there has been an increase in the research of multimodal, or combined, treatment strategies (Arnold et al., 1997; MTA Cooperative Group, 1999a, 1999b; Richters et al., 1995).

Studies investigating the combination of medication with other approaches have been equivocal (Jensen & Payne, 1998). Early multimodal treatment studies found that the behavior of students with ADHD improved with long-term, combined treatment (Satterfield, Cantwell, & Satterfield, 1979). Combining cognitive-behavioral interventions with medication also demonstrated promising results in reducing negative social behaviors of children with ADHD (Hinshaw, Henker, & Whalen, 1984). Combining problem-solving/social skills training with parent and teacher education demonstrated improvements with regard to in-class, disruptive, off-task behavior of students with ADHD (Bloomquist, August & Ostrander, 1991). Similarly, research on social skills training combined with behavior management was found to be superior to social skills training alone (Pelham & Bender, 1982). More recent reviews have indicated that the effects of psychosocial treatment have been most effective when used in combination with a low dose of psychostimulant medication (Pelham et al., 1998) and that no treatment has demonstrated major improvements on poor peer relationships (Pelham et al., 1998).

Based on the promising research regarding combined treatment efficacy for ADHD, a need was established for a collaborative multisite study to investigate treatment combinations. The National Institute of Mental Health (NIMH) Collaborative Multimodal Treatment Study of Children with ADHD (the MTA) was created (Arnold et al., 1997). The researchers set out to answer the manifold question: "Under what circumstances (comorbid conditions, age, gender, family background) do which treatment combinations (medication, behavior therapy, parent training, school-based intervention) have what impacts (improvement, stasis, deterioration) on what domains of child functioning (cognitive, academic, behavioral, physical, peer relations, family relations), for how long (short-versus long-term) to what extent (effect sizes, normal versus pathological range), and why (process underlying change)?" (Arnold, et al., p. 996). The notable strengths of the study include its large sample size, the long-term interventions, and the random assignment of participants to treatment conditions (Hinshaw et al., 2000).

This 5-year study, utilizing 579 subjects, is the largest and most comprehensive treatment study of ADHD that has ever been conducted (Arnold et al., 1997). Generally, "it compares the effects of carefully titrated and monitored doses of the most commonly use treatment with each other and with typical treatment in the community" (Campbell, 2000, p. 481). A plethora of results have recently been published. Due to the scope of the project, it is helpful to first

understand how this study was designed and conducted.

Participants were randomly assigned to one of four intensive, 14-month long treatments at one of six treatment sites (MTA Cooperative Group, 1999a). Children in the *medication management* group received medication only (either Ritalin, Cylert, or Dexedrine) in a double-blind study design. Dosages were carefully monitored and adjusted in a very ideal way for each child in order to determine his/her appropriate amount. Participants in the *behavioral treatment* group received intensive parent training, child-focused treatment, and school-based intervention. The parent training treatment consisted of 27 group sessions and 8 individual sessions per family. The child-focused treatment was an 8 week, 5 days-a-week summer treatment program where children were able to earn rewards for following well-defined rules and meeting behavioral expectations. Social skills training and academic training were also provided. The school-based treatment was comprised of two components, 10-16 biweekly teacher consultation sessions focused on behavior management strategies and 12 weeks of a part-time paraprofessional aide who worked directly in the classroom with the child. A daily report card was used to link the child's behavior at school with consequences at home. Children in the *combined treatment* group received all the treatments described above that the groups in the *medication management* and *behavioral treatment* received. The fourth treatment was the *community care treatment*. Since it would not be ethical to assign children to a no-treatment

control group for as long as 14 months, the children in this group were referred to community mental health resources following a diagnosis of ADHD.

A tremendous amount of data is resulting from this study and at the risk of oversimplification, main findings to date are briefly described. Initial results demonstrate that children in all four groups showed significant reductions in ADHD symptoms over the 14-month period (MTA Cooperative Group,1999a). Medication management alone was clearly superior to behavior treatment alone in reducing ADHD symptoms. However, this finding did not extend to other areas of the children's functioning, such as peer relations, academic performance and oppositional behavior. Interestingly, combined treatment did not differ significantly from medication management. This suggests that for most children with ADHD, adding behavioral interventions to very well-controlled medication management is not likely to yield great improvements. In other words, for many children with ADHD, medication alone is likely to be an effective and perhaps sufficient treatment when care is taken to determine the optimal dose for each child. When interpreting this finding, it is important to reflect on how intense and thorough the medication management portion of the study was. That being said, however, children who received behavioral treatment, in addition to medication management, were able to be maintained on a lower dose of medication.

Though results indicated that the combined treatment condition did not demonstrate significant benefits over medication treatment alone, combined

treatment did prove to be superior in ameliorating non-ADHD symptoms such as aggression, internalizing symptoms, social problems, parent-child relationships, and reading skills (MTA Cooperative Group, 1999a). Behavioral treatment did significantly reduce ADHD symptoms and demonstrated improvement in other domains. Therefore, it is reasonable to conclude that behavioral intervention works best when combined with other interventions, such as medication management. Further results indicate that for children with comorbid anxiety, psychosocial treatment proved to be equal to medication management and combined treatment (MTA Cooperative Group, 1999b).

Due to the heterogeneity of symptoms of ADHD, it can be expected that different children with ADHD will benefit from different combinations of treatments based on their specific presenting problems. This issue of matching needs with treatments is particularly crucial when addressing the likelihood of providing this level of "goodness of fit" outside of the research setting (Greene & Ablon, 2001). In other words, future research on ADHD should focus on aspects of matching treatment to the assessed needs of children with ADHD, as well as those of their parents and teachers as, "…it is by no means clear that reduction of ADHD-related symptoms is the most potent predictor of long-term outcomes for such children…" (Greene & Ablon, 2001, p. 119).

Summarizing the need to continue to address school-based treatment for children with ADHD, DuPaul and Stoner (1994) cogently state:

… children with this disability continue to encounter significant difficulties in succeeding in our schools. To correct this situation, gains must be made in two major areas. First, practitioners in the fields of psychology and education must increase their awareness and understanding of the limitations of students with this disorder…. Children with this disorder are encountered in every type of school setting, therefore all educators should possess at least minimal competencies in identifying these children and designing effective educational programming to meet their needs and help them become successful, productive citizens. Second, the technology of assessing and treating children with ADHD must be improved…. Further, treatment modalities that are effective on the one hand, while cost-efficient and acceptable to consumers on the other, are sorely needed. Thus, the challenge is for research to lead to effective practice such that long-term improvements in school performance are attained for all children with ADHD (p. 236).

REFERENCES

American Psychiatric Association. (1968). *Diagnostic and statistical manual of mental disorders (2nd ed.)*. Washington, DC: Author.

American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders (3rd ed.)*. Washington, DC: Author.

American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders (3rd ed., Rev.)*. Washington, DC: Author.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders (4th ed.)*. Washington, DC: Author.

Anastopoulos, A.D. (1996). Facilitating parental understanding and management of attention-deficit/hyperactivity disorder. In M.A. Reinecke, F.M. Dattilio, & A. Freeman (Eds.), *Cognitive therapy with children and adolescents.* New York: Guilford Press.

Anastopoulos, A.D., & Barkley, R.A. (1992). Attention deficit-hyperactivity disorder. In C.E. Walker & M.C. Roberts (Eds.), *The handbook of clinical child psychology: (2nd ed.).* New York: John Wiley & Sons.

Anastopoulos, A.D., Shelton, T.L., DuPaul, G.J., & Guevremont, D.C. (1993). Parent training for attention deficit hyperactivity disorder: Its impact on parent functioning. *Journal of Abnormal Child Psychology, 21*, 581-596.

Arnold, L.E., Abikoff, H.B., Cantwell, D.P., Conners, C.K., Elliott, G.,

Greenhill, L.L., Hechtman, L., Hinshaw, S.P., Hoza, B., Jensen, P.S., Kraemer, H.C., March, J.S., Newcorn, J.H., Pelham, W.E., Richters, J.E., Schiller, E., Sever, J.B., Swanson, J.M., Vereen, D., & Wells, K.C. (1997). National Institute of Mental Health Collaborative multimodal treatment study of children with ADHD (the MTA): Design challenges and choices. *Archives of General Psychiatry, 54*, 865-870.

Bacon, E.H. & Schulz, J.B. (1991). A survey of mainstreaming practices. *Teacher Education and Special Education, 14*, 144-149.

Barkley, R.A. (1989). Attention deficit hyperactivity disorder. In E. Mash & R. Barkley (Eds.), *Treatment of childhood disorders* (pp. 39-72). New York: Guilford Press.

Barkley, R.A. (1990). *Attention deficit hyperactivity disorder: A handbook for diagnosis and treatment*. New York: Guilford Press.

Barkley, R.A. (1993, April). Eight principles to guide ADHD children. *The ADHD Report*, 1.

Barkley, R.A. (1997a). Behavioral inhibition, sustained attention, and executive functions: Constructing a unifying theory of ADHD. *Psychological Bulletin, 121* (1), 65-94.

Barkley, R.A. (1997b). *ADHD and the nature of self-control*. New York: Guilford Press.

Barkley, R.A. (1998). *Attention-deficit/hyperactivity disorder: A handbook*

for diagnosis and treatment (2nd ed.). New York: Guilford Press.

Barkley, R.A. (2003). Issues in the diagnosis of attention-deficit/hyperactivity disorder in children. *Brain and Development*, *25* (2), 77-83.

Barkley, R.A., Copeland, A.P., & Sivage, C. (1980). A self-control classroom for hyperactive children. *Journal of Autism and Developmental Disorder, 10* (1), 75-89.

Barkley, R.A., DuPaul, G.J., & McMurray, M.B. (1990). A comprehensive evaluation of attention deficit disorder with and without hyperactivity as defined by research criteria. *Journal of Consulting and Clinical Psychology, 58* (6), 775-789.

Barkley, R.A., Fischer, M., Edelbrock, C.S., & Smallish, L. (1990). The adolescent outcome of hyperactive children diagnosed by research criteria: I. An 8 year prospective follow-up study. *Journal of the American Academy of Child and Adolescent Psychiatry, 29* (4), 546-557.

Batsche, G.M., & Knoff, H.M. (1994). Children with attention deficit hyperactivity disorder: A research review with assessment and intervention implications for schools and families. *Special Services in the Schools, 9* (1), 69-95.

Becker, M.G., Isaac, W., & Hynd, G. W. (1987). Neuropsychological development of nonverbal behaviors attributed to "frontal lobe" functioning. *Developmental Neuropsychology, 3* (3-4), 275-298.

Bender, W.N. (1995). The case against mainstreaming: Empirical support for the political backlash. *Education, 105*, 279-287.

Bender, W.N., & Ukije, I.C. (1989). Instructional strategies in mainstream classes: Prediction of the strategies teachers select. *Remedial and Special Education, 10* (2), 23-30.

Bhatia, M.S., Nigam, V.R., Bohra, N., & Malik, S.C. (1991). Attention deficit disorder with hyperactivity among pediatric outpatients. *Journal of Child Psychology and Psychiatry, 32* (2), 297-306.

Biederman, J., Baldessarini, R.J., Wright, V., Keenan, K., & Faraone, S. (1993). A double-blind placebo controlled study of desipramine in the treatment of ADHD: III. Lack of impact of comorbidity and family history factors on clinical response. *Journal of American Academy of Child and Adolescent Psychiatry, 32* (1), 199-204.

Biederman, J., Newcorn, J., & Sprich, S. (1991). Comorbidity of attention deficit hyperactivity disorder with conduct, depressive, anxiety, and other disorders. *American Journal of Psychiatry, 148* (5), 564-577.

Bloomquist, M.L. (1996). *Skills training for children with behavioral disorders*. New York: Guilford Press.

Bloomquist, M.L., August, G.J., & Ostrander, R. (1991). Effects of a school-based cognitive-behavioral intervention for ADHD children. *Journal of Abnormal Child Psychology, 19* (5), 591-605.

Blouin, A.G., Bornstein, M.A., & Trites, R.L. (1978). Teenage alcohol abuse among hyperactive children: A five year follow-up study. *Journal of Pediatric Psychology*, *3*, 188-194.

Boucugnani, L.L., & Jones, R.W. (1989). Behaviors analogous to frontal lobe dysfunction in children with attention deficit hyperactivity disorder. *Archives of Clinical Neuropsychology*, *4*, 161.

Braswell, L., & Bloomquist, M.L. (1991). *Cognitive-behavioral therapy with ADHD children: Child, family, and school interventions*. New York: Guilford Press.

Brown, R.T., & Borden, K.A. (1986). Hyperactivity in adolescence: Some misconceptions and new direction. *Journal of Clinical Child Psychology, 15*, 194-209.

Campbell, S.B. (2000). Editor's note. *Journal of Abnormal Child Psychology, 28* (6), 481.

Carlson, C.L., & Tamm, L. (2000). Responsiveness of children with attention-deficit/hyperactivity disorder to reward and response cost: Differential impact on performance and motivation. *Journal of Consulting and Clinical Psychology, 68*, 73-83.

Castellanos, F.X. (1997). Toward a pathophysiology of attention-deficit/hyperactivity disorder. *Clinical Pediatrics, 36* (7), 381-393.

Castellanos, F.X., Giedd, J.N., Eckburg, P., Marsh, W.L., Vaituzis, C.,

Kaysen, D., Hamburger, S.D., & Rapoport, J.L. (1994). Quantitative morphology of the caudate nucleus in attention deficit hyperactivity disorder. *American Journal of Psychiatry, 151*, 1791-1796.

Castellanos, F.X., Giedd, J.N., Marsh, W.L., Hamburger, S.D., Vaituzis, C., Dickstein, D.P., Sarfatti, S.E., Vauss, Y.C., Snell, J.W., Lange, N., Kaysen, D., Krain, A.L., Ritchie, G.F, Rajapakse, J.C., & Rapoport, J.L. (1996). Quantitative brain magnetic resonance imaging in attention-deficit hyperactivity disorder. *Archives of General Psychiatry, 53*, 607-616.

Conners, C., Casat, C., Gualtieri, C., Weller, E., Reader, M., Reiss, A., Weller, R., Khayrallah, M., & Ascher, J. (1996). Buproprion hydrochloride in attention deficit disorder with hyperactivity. *Journal of the American Academy of Child and Adolescent Psychiatry, 35*, 1314-1321.

Connor, D.F. (2000). A pilot study of methylphenidate, clonidine, or the combination in ADHD comorbid with aggressive oppositional defiant or conduct disorder. *Clinical Pediatrics, 39* (1),15-33.

Connor, D.F. (1998). Other medications in the treatment of child and adolescent ADHD. In R.A. Barkley (Ed.), *Attention deficit hyperactivity disorder: A handbook for diagnosis and treatment* (2nd ed.) (pp. 561-581). New York: Guilford Press.

Connor, D.F., & Swanson, J.M. (1999). Clonidine and guanfacine in the treatment of children with ADHD and associated conditions. *Child & Adolescent Psychopharmacology News, 4* (3), 1-8.

Davila, R.R., Williams, M.L., & MacDonald, J.T. (1991). *Memorandum to chief state school officers re: Clarification of policy to address the needs of children with attention deficit disorder with general and/or special education*. Washington, DC: U.S. Department of Education.

Dawson, M.M. (1995). Best practices in planning intervention for students with attention disorders. In A. Thomas and J. Grimes (Eds.), *Best practices in school psychology* (3rd ed.). Washington, DC: National Association of School Psychologists.

Dubey, D., O'Leary, S., & Kaufman, K. (1983). Training parents of hyperactive children in child management: A comparative outcome study. *Journal of Abnormal Child Psychology, 11* (2), 229-246.

Dunlap, G., de Perczel, M., Clarke, S., Wilson, D., Wright, S., White, R., & Gomez, A. (1994). Choice making to promote adaptive behavior for students with emotional and behavior challenges. *Journal of Applied Behavior Analysis, 27*, 505-518.

DuPaul, G.J., Barkley, R.A., & Connor, D.F. (1998). Stimulants. In R.A. Barkley (Ed.), *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment* (2nd ed.) (pp. 510-551). New York: Guilford

Press.

DuPaul, G.J. & Eckert, T.L. (1998). Academic interventions for students with attention-deficit/hyperactivity disorder: A review of the literature. *Reading and Writing Quarterly: Overcoming Learning Difficulties, 14* (1), 59-82.

DuPaul, G.J., & Eckert, T.L. (1997). The effects of school-based interventions for Attention-Deficit/Hyperactivity Disorder: A meta-analysis. *School Psychology Review, 26* (1), 5-27.

DuPaul, G.J., & Stoner, G. (1994). *ADHD in the schools: Assessment and intervention strategies*. New York: Guilford Press.

DuPaul, G.J., Stoner, G., & O'Reilly, M.J. (2002). Best practices in classroom interventions for attention problems. In A. Thomas & J. Grimes (Eds.), *Best Practices in School Psychology* (4th ed.). MD: National Association of School Psychologists.

Elia, J., Borcherding, B.G., Potter, W.Z., Mefford, I.N., Rapoport, J.L., & Keysor, C.S. (1990). Stimulant drug treatment of hyperactivity: Biochemical correlates. *Clinical Pharmacology Therapy, 48*, 57-66.

Elliott, S.N. (1986). Children's ratings of the acceptability of classroom interventions for misbehavior: Findings and methodological considerations. *Journal of School Psychology, 24*, 23-35.

Ernst, M., Liebenauer, L.L., King, A.C., Fitzgerald, G.A., Cohen, R.M., &

Zametkin, A.J. (1994). Reduced brain metabolism in hyperactive girls. *Journal of American Academy of Child and Adolescent Psychiatry, 35*, 596-598.

Ervin, R.A., Bankert, C.L., & DuPaul, G. (1996). Treatment of attention-deficit/hyperactivity disorder. In M.A. Reinecke, F.M. Dattilio, & A. Freeman (Eds.), *Cognitive therapy with children and adolescents*. New York: Guilford Press.

Fadley, J.L., & Hosler, V.N. (1992). *Attentional deficit disorder in children and adolescents*. Springfield, Illinois: Charles C. Thomas Publisher.

Fergusson, D.M., Lynskey, M.T., & Horwood, L.J. (1997). Attentional difficulties in middle childhood and psychosocial outcomes in young adulthood. *Journal of Child Psychology and Psychiatry, 38* (6), 633-644.

Fine, M.J., & Jennings, J. (1992). Family therapy's contributions to parent education. In M.J. Fine & C. Carlson (Eds.), *The handbook of family-school intervention: A systems perspective*. Boston: Allyn and Bacon.

Fiore, T., Becker, E.A., & Nero, R.C. (1993). Educational interventions for students with attention deficit disorder. *Exceptional Children, 60* (2), 163-173.

Flick, G.L. (1998). *ADD/ADHD behavior-change resource kit: Ready-to-use strategies and activities for helping children with attention deficit disorder*. New York: The Center for Applied Research in Education.

Frederick, B.P., & Olmi, D.J. (1994). Children with attention-deficit/hyperactivity disorder: A review of the literature on social skills deficits. *Psychology in the Schools*, *31*, 288-296.

Garfinkel, B.D. & Klee, S.H. (1985). Behavioral and personality characteristics of adolescents with a history of childhood ADD. In L. M. Bloomingdale (Ed.), *Attention deficit disorder: Identification, course and rationale*. New York: Medical and Scientific Books.

Gibson, S. & Dembo, M.H. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology*, *76,* 4, 569-582.

Ghaith, G., & Yaghi, H. (1997). Relationships among experience, teacher efficacy and attitudes toward implementation of instructional interventions. *Teaching and Teacher Education, 13* (4), 451-458.

Giedd, J.N., Castellanos, F.X., Casey, B.J., Kozuch, P., King, A.C., Hamburger, S.D., & Rapoport, J.L. (1994). Quantitative morphology of the corpus callosum in attention deficit hyperactivity disorder. *American Journal of Psychiatry, 151*, 665-669.

Gjone, H., Sundet, J.M., & Stevenson, J. (1999). Genetic influence on parent-reported attention-related problems in Norwegian general population twin sample. *Journal of the American Academy of Child and Adolescent Psychiatry, 35* (5), 588-597.

Glass, C.S., & Wegar, K. (2000). Teacher perceptions of the incidence

and management of attention deficit hyperactivity disorder. *Education, 121* (2), 412-421.

Goldstein, S. (1992*). Educating inattentive children* [Video tape]. Neurology, Learning, & Behavior Center.

Green, W.H. (1995). The treatment of attention-deficit hyperactivity disorder with nonstimulant medications. *Child and Adolescent Psychiatric Clinics of North America, 4,* 169-195.

Greene, R.W., & Ablon, J.S. (2001). What does the MTA study tell us about effective psychosocial treatment for ADHD? *Journal of Clinical Child Psychology, 30*,1, 114-121.

Greenhill, L.L. (November 16-18, 1998). *Stimulant medications*. Paper presented at the NIH Consensus Development Conference on Diagnosis and Treatment of Attention Deficit Hyperactivity Disorder. William H. Natcher Conference Center. National Institutes of Health.

Haladyna, T.M. (1997). *Writing test items to evaluate higher order thinking*. Boston: Allyn & Bacon.

Hakola, S. (1992). Legal rights of student with attention deficit disorder. *School Psychology Quarterly, 7*, 285-297.

Hallowell, E.M., & Ratey, J.J. (1994). *Driven to distraction: Recognizing and coping with attention deficit disorder from childhood through adulthood*. New York: Touchstone.

Hechtman, L. (1994). Genetic and neurobiological aspects of attention deficit hyperactivity disorder: A review. *Journal of Psychiatric Neuroscience, 29* (3), 193-201.

Heilman, K.M., Voeller, M.D., & Nadeau, S.E. (1991). A possible pathophysiologic substrate of attention deficit hyperactivity disorder. *Journal of Child Neurology*, *6*, s86-s81.

Henker, B. & Whalen, C.K. (1989). Hyperactivity and attention deficits. *American Psychologist*, *44* (2), 216-223.

Hinshaw, S.P., & Erhardt, D. (1993). Behavioral treatment. In V.B. VanHasselt & M. Hersen (Eds.), *Handbook of behavior therapy and pharmacotherapy for children: A comparative analysis* (pp. 233-271). Needham Heights, MA: Allyn & Bacon.

Hinshaw, S.P., Henker, B., & Whalen, C.K. (1984). Self-control in hyperactive boys in anger-inducing situations: Effects of cognitive-behavioral training and of methylphenidate. *Journal of Abnormal Child Psychology, 12,* 55-77.

Hinshaw, S.P., Owens, E.B., Wells, K.C., Kraemer, H.C., Abikoff, H.B., Arnold, L.E., Conners, C.K., Elliott, G., Greenhill, L.L., Hechtman, L., Hoza, Jensen, P.S., March, J.S., Newcorn, J.H., Pelham, W.E., Swanson, J.M., Bitiello, B., & Wigal, T. (2000). Family processes and treatment outcome in the MTA: Negative/ineffective parenting practices in relation

to multimodal treatment. *Journal of Abnormal Child Psychology, 28*, 555-568.

Hocutt, A.M., McKinney, J.D., & Montague, M. (1993). Issues in the education of children with attention deficit disorder. *Exceptional Children, 60* (2), 103-106.

Hoff, K.D., Doepke, K., & Landau, S. (2002). Best practices in the assessment of children with attention-deficit/hyperactivity disorder: Linking assessment to intervention. In A. Thomas & J. Grimes (Eds.), *Best Practices in School Psychology* (4th ed.). MD: National Association of School Psychologists.

Hoza, B. (2001). Psychosocial treatment issues in the MTA: A reply to Greene and Ablon. *Journal of Clinical Child Psychology, 30* (1), 126-131.

Hunt, R.D., Arnsten, A.F.T., & Asbell, M.D. (1995). An open trial of guanfacine in the treatment of attention-deficit hyperactivity disorder. *Journal of the American Academy of Child and Adolescent Psychiatry, 34*, 50-54.

Hynd, G., Semrud-Clikeman, M., Lorys, A.R., Novey, D., & Eliopulos, D. (1990). Brain morphology in developmental dyslexia and attention deficit hyperactivity disorder. *Archives of Neurology, 47*, 919-926.

Hynd, G., Semrud-Clikeman, M., Lorys, A.R., Novey, D., Eliopulos, D., &

Lyytinen, H. (1991). Corpus callosum morphology in attention deficit disorder: Morphometric analysis of MRI. *Journal of Learning Disabilities*, *24 (*3), 141-146.

Jensen, P.S., Payne, J.D. (1998). *Behavioral and medication treatments for attention deficit hyperactivity disorder: Comparisons and combinations*. Paper presented at the NIH Consensus Development Conference on Diagnosis and Treatment of Attention Deficit Hyperactivity Disorder. William H. Natcher Conference Center. National Institutes of Health.

Jordan, D.R. (1988). *Attention deficit disorder: ADD syndrome*. Austin, Texas: Pro-Ed.

Kallas, A., Reeve, R.E., Welch, A.B., & Wright, J.V. (1997). A continuing education program on attention deficit/hyperactivity disorder. *Teacher Education & Special Education, 20* (2), 114-122.

Kane, R., Mikalac, C., Benjamin, S., & Barkley, R.A. (1990). Assessment and treatment of adults with ADHD. In R.A. Barkley (Ed.), *Attention deficit hyperactivity disorder: A handbook for treatment and diagnosis*. New York: Guilford Press.

Kendall, P.C., & Braswell, L. (1985). *Cognitive-behavioral therapy for impulsive children*. New York: Guilford Press.

Landau, S., & Burcham, B.G. (1995). Best practices in the assessment of

children with attention disorders. In A. Thomas & J. Grimes (Eds.), *Best practices in school psychology*—(3rd ed.). Washington, DC: The National Association of School Psychologists.

Landau, S., Milich, R., & Diener, M.B., (1998). Peer relations of children with Attention-Deficit Hyperactivity Disorder. *Reading and Writing Quarterly: Overcoming Learning Difficulties, 14*, 83-105.

Leimkuhler, M.E. (1994). Attention deficit disorder in adults and adolescents: Cognitive, behavioral, and personality styles. In J.M. Ellison, C.S. Weinstein, & T. Hodel-Malinofsky (Eds.), *The psychotherapist's guide to neuropsychiatry: Diagnostic and treatment issues* (pp. 175-216). Washington DC: American Psychiatry Press, Inc.

Lou, H.C., Hendriksen, L., Bruhn, P., Borner, H., & Nielsen, J.B. (1989). Striatal dysfunction in attention deficit and hyperkinetic disorder, *Archives of Neurology*, *46*, 48-52.

McCracken, J.A. (1991). A two-part model of stimulant action on attention-deficit/hyperactivity disorder in children. *Journal of Neuropsychiatry, 3*, 201-209.

McGee, R., & Share, D.L. (1988). Attention deficit disorder hyperactivity and academic failure: Which comes first and what should be treated? *Journal of the American Academy of Child and Adolescent Psychiatry*, *27*, 318-325.

McMahon, R.C. (1980). Genetic etiology in the hyperactive child syndrome: A critical review. *American Journal of Orthopsychiatry*, *50*, 145-150.

MTA Cooperative Group. (1999a). A 14-month randomized clinical trial of treatment strategies for attention-deficit/hyperactivity disorder. *Archives of General Psychiatry, 56*, 1073-1086.

MTA Cooperative Group. (1999b). Moderators and mediators of treatment response for children with attention-deficit/hyperactivity disorder. *Archives of General Psychiatry, 56*, 1088-1096.

Munson, S.M. (1986). Regular education teacher modifications for mainstreamed mildly handicapped students. *The Journal of Special Education, 20*, 489-502.

Newby, R.F., Fischer, M., & Roman, M.A. (1991). Parent training for families of children with ADHD. *School Psychology Review*, *20* (2), 252-265.

Parker, J.G., & Asher, S.R. (1987). Peer relations and later personal adjustment: Are low accepted children at risk? *Psychological Bulletin*, *102*, 357-389.

Pelham, W.E., & Bender, M.E. (1982). Peer relationships in hyperactive

children: Description and treatment. In K.D. Gadow & I. Bialer (Eds.), *Advances in learning and behavioral disabilities* (Vol. 1, pp. 365-436). Greenwich, CT: JAI Press.

Pelham, W.E., Wheeler, T., & Chronis, A. (1998). Empirically supported psychosocial treatments for attention deficit hyperactivity disorder. *Journal of Clinical Child Psychology, 27* (2), 190-205.

Pfiffner, L.J., & Barkley, R.A., (1990). Educational placement and classroom management. In R.A. Barkley (Ed.), *Attention deficit hyperactivity disorder: A handbook for diagnosis and treatment* (pp. 498-539). New York: Guilford Press.

Pliszka, S. (1989). Effect of anxiety on cognition, behavior, and stimulant response in ADHD. *Journal of the American Academy of Child and Adolescent Psychiatry, 28*, 882-887.

Pliszka, S.R. (1991). Comorbidity of attention-deficit hyperactivity disorder and overanxious disorder. *Journal of the American Academy of Child and Adolescent Psychiatry, 31* (2), 197-203.

Posner, M.I., & Peterson, S.E. (1988). The attention system of the human brain. *Annual Review of Neuroscience*, 345.

Quinn, P.O. (1995). Neurobiology of attention deficit disorder. In K.G.

Nadeau (Ed.), *A comprehensive guide to attention deficit disorder in adults: Research, diagnosis and treatment*. New York: Brunner/Mazel Publishers.

Raskin, L.H., Shaywitz, S.E., Shaywitz, B.A., Anderson, G.M., & Cohen, D.J. (1984). Neurochemical correlates of attention deficit disorder. *Pediatric Clinics of North America, 31*, 387-396.

Rhode, G., Jenson, W.R., Reavis, H.K. (1995). *The tough kid book: Practical classroom management strategies*. Longmont, CO: Sopris West.

Ricco, C.A., Hynd, G.W., Cohen, M.J., & Gonzales, J.J. (1993). Neurological basis of attention deficit hyperactivity disorder. *Exceptional Children, 60* (2), 118-124.

Richters, J.E., Arnold, L.E., Jensen, P.S., Abikoff, H., Conners, C.K., Greenhill, L.L, Hechtman, L., Hinshaw, S.P., Pelham, W.E., & Swanson, J.M. (1995). NIMH collaborative multisite multimodal treatment study of children with ADHD: I. Background and rationale. *Journal of the American Academy of Child and Adolescent Psychiatry, 34*, 987-1000.

Robin, A.L. & Foster, S.L. (1989). *Negotiating parent-adolescent conflict: A behavioral family systems approach*. New York: Guilford Press.

Rogeness, G.S., Maas, J.W., Javors, M.A., & Macedo, C.A. (1989). Attention deficit disorder symptoms and urine catecholamines. *Psychiatry*

Research, *27*, 241.

Rutter, M. (1982). Syndromes attributed to "minimal brain dysfunction" in childhood. *American Journal of Psychiatry*, *139*(1), 21-33.

Sabatino, D.A., & Vance, H.B. (1994). Is the diagnosis of attention deficit/hyperactivity disorders meaningful? *Psychology in the Schools, 31*, 188-196.

Safer, D.J., & Zito, J.M. (1996). Increased methylphenidate usage for attention deficit disorder in the 1990s. *Pediatrics, 98* (6), 1084-1094.

Satterfield, J.H., Cantwell, D.P., & Satterfield, B.T. (1979). Multimodal treatment: A one-year follow-up of 84 hyperactive boys. *Archives of General Psychiatry, 36*, 965-974.

Schaub, J.M. (1998). *Your kid has ADHD, now what?* Minnesota: Beaver's Pond Press.

Schleifer, M., Weiss, G., Cohen, N.J., Elman, M., Cvejic, H., & Kruger, E. (1975). Hyperactivity in preschooler and the effects of methylphenidate. *American Journal of Orthopsychiatry, 45*, 38-50.

Semrud-Clikeman, M., Biederman, J., Sprich-Buckminster, S., Lehman, B.K., Faraone, S.V., & Norman, D. (1992). Comorbidity between ADDH and learning disability: A review and report in a clinically referred sample. *Journal of the American Academy of Child & Adolescent Psychiatry, 31* (3), 439-448.

Semrud-Clikeman, M., Filipek, P., Biederman, J., Steingard, R., Kennedy, D., Renshaw, P., & Bekken, K. (1994). Attention-deficit hyperactivity disorder: Magnetic resonance imaging morphometric analysis of the corpus callosum. *Journal of the American Academy of Child and Adolescent Psychiatry, 33* (6), 875-881.

Semrud-Clikeman, M., Neilsen, K.H., Clinton, A., Sylvester, L., Parle, N., & Connor, R.T. (1999). An intervention approach for children with teacher- and parent-identified attentional difficulties. *Journal of Learning Disabilities, 32* (6), 581-590.

Smalley, S. (2000). UCLA Genetic Study. *Attention: The Magazine for Families and Adults with Attention-Deficit/Hyperactivity Disorder, 6* (5), 12-14.

Sokolenko, M. & Kutcher, S. (1999). Practical tips in managing side effects of the newer antidepressants. *Child and Adolescent Psychopharmacology News, 4* (3), 11.

Spencer, T., Biederman, J., & Wilens, T. (1998). Pharmacotherapy of ADHD with antidepressants. In R.A. Barkley (Ed.), *Attention deficit hyperactivity disorder: A handbook of diagnosis and treatment*. New York: Guilford Press.

Spencer, T., Biederman, J., Wilens, T., Harding, M., O'Donnell, D., &

Griffin, S. (1996). Pharmacotherapy of attention-deficit hyperactivity disorder across the life cycle. *Journal of the American Academy of Child and Adolescent Psychiatry, 52,* 434-443.

Spreen, O., Risser, A.H., & Edgell, D. (1995). *Developmental neuropsychology*. New York: Oxford University Press.

Strayhorn, J.M., & Weiderman, C.S. (1989). Reduction of attention deficit and internalizing symptoms in preschoolers through parent-child interaction training. *Journal of the American Academy of Child and Adolescent Psychiatry, 28*, 888-896.

Teeter, P.A. (1991). Attention deficit hyperactivity disorder: A psychoeducational paradigm. *School Psychology Review*, *20*, 266-280.

Teeter, P.A. (1998) *Interventions for ADHD: Treatment in developmental context.* New York: Guilford Press.

Teeter, P.A., & Semrud-Clikeman, M. (1997). *Child neuropsychology: Assessment and intervention for neurodevelopmental disorders*. Boston: Allyn & Bacon.

U.S. Department of Education (1999). *Twenty-first annual report to Congress: Implementation of the Individuals with Disabilities Act*. Washington, DC: Author.

U.S. Department of Education (1993). *Education of children with attention-deficit disorder.* Washington, DC: Chesapeake Institute.

Verhulst, F.C., van der Ende, J., Ferdinand, R.F., & Kasius, M.C. (1997). The prevalence of DSM-IIIR diagnosis in a national sample of Dutch adolescents. *Archives of General Psychiatry, 54*, 329-336.

Webster-Stratton, C. (1993). Randomized trial of two parent-training programs for families with conduct disordered children. *Journal of Consulting and Clinical Psychology, 52*, 666-678.

Weiss, G. & Hechtman, L.T. (1986). *Hyperactive children grown up*. New York: Guilford Press.

Weiss, G., & Hechtman, L.T. (1993). *Hyperactive children grown up: ADHD in children, adolescents, and adults*. New York: Guilford Press.

Well-Connected Group (2002). *What are the medications for Attention-Deficit Hyperactivity Disorder?* WebMD [On-line]. Available: my.webmd.com/content/article/1680.52950.

Wender, P.H. (1987). *The hyperactive child, adolescent, and adult: Attention deficit disorder through the lifespan*. New York: Oxford University Press.

Wender, P. (1995). *Attention-deficit hyperactivity disorder in adults*. New York: Oxford University Press.

Whalen, C.K., & Henker, B. (1991). Therapies for hyperactive children: Comparisons, combinations, and compromises. *Journal of Consulting and Clinical Psychology*, *59*, 126-137.

Whalen, C.K., Henker, B., & Dotemoto S. (1981). Teacher response to the methylphenidate (Ritalin) versus placebo status of hyperactive boys in the classroom. *Child Development*, *52*, 1005-1014.

Whalen, C.K., Henker, B., & Hinshaw, S. (1985). Cognitive-behavioral therapies for hyperactive children: Premises, problems, and prospects. *Journal of Abnormal Child Psychology, 13* (3), 391-410.

Wilens, T.E., Spencer, T.J., & Biederman, J. (1995). Pharmacotherapy of adult ADHD. In K.G. Nadeau (Ed.), *A comprehensive guide to attention deficit disorder in adults: Research, diagnosis and treatment*. New York: Brunner/Mazel Publishers.

Zametkin, A.J., Nordahl, T.E., Gross, M., King, A.C., Semple, W.E., Rumsey, J., Hamburger, S., & Cohen, R. (1990). Cerebral glucose metabolism in adults with hyperactivity of childhood onset. *New England Journal of Medicine, 323*, 1361-1366.

Zametkin. A.J., & Rapoport, J.L. (1987a). Neurobiology of attention deficit disorder with hyperactivity: Where have we come in 50 years? *Journal of the American Academy of Child and Adolescent Psychiatry*, *26*, 676-686.

Zametkin, A.J., & Rapoport, J.L. (1987b). Noradrenergic hypothesis of attention deficit hyperactivity: A critical review. In H.Y. Meltzer (Ed.), *Psychopharmacology: The third generation of progress* (pp. 837-842). Raven Press: New York.

APPENDIX C

Table C1

Description of an ADHD Staff Development Program

Unit	Description
Unit 1	Characteristics and Needs of Students with AD/HD • background information on AD/HD • primary characteristics and associated features • common myths and beliefs
Unit 2	Policy and Procedures for AD/HD • brief history of policies governing services for individuals with AD/HD • legislation regarding education of students with AD/HD • compliance and due process
Unit 3	Assessment and Identification of Students with AD/HD • general overview of evaluation process • typical assessment devices and procedures used • interpretation of results • making recommendations for placement and programming

Table C1 (c*ontinued)*

Overview of an ADHD Staff Development Program

Unit	Description
Unit 4	Interventions for Students with AD/HD • model for designing interventions for students with AD/HD using functional assessment procedures • appropriate classroom interventions • role of medication in treatment
Unit 5	Collaborative Consultation and AD/HD • collaborative process • need for multidisciplinary teams • recommendations for school-home coordination programs

Note. Summarized from "A Staff Development Program in Attention Deficit Hyperactivity Disorder," by M. Montague, C. Warger, and J. Harris, 1997, *Teacher Education & Special Education, 20* (2), p. 107.

Table C2

Overview of Project Facilitate: An Inservice Education Program for Educators and Parents

---

Facilitator's Guide: To be used by the school-based team members responsible for implementation of the inservice education program.

- Provides information regarding roles and responsibilities of school-based team
- Presents procedural options for individualizing the program

General Knowledge Base Manual: Information is presented regarding the nature and needs of elementary children with ADHD

- Details criteria for ADHD
- Primary/secondary characteristics
- Prevalence
- Causes
- Primary/secondary characteristics
- Prevalence
- Causes
- Myths and misperceptions
- Teacher/parent difficulties
- Collaborative roles for teachers and parents

Table C2 (continued)

Overview of Project Facilitate: An Inservice Education Program for Educators and Parents

---

Legal Issues Manual: Provides an overview of federal laws that apply to children with ADHD.

- Identifies ways to advocate for children with ADHD
- Provides models for Section 504 programs

Assessment Manual: Identifies problematic issues in school-based assessment.

- Reviews commonly used instruments
- Delineates types of assessment approaches
- Provides school-based assessment approach and protocol

Intervention Manual: Provides essential information regarding medical and school/home interventions for students with ADHD.

- Common medical interventions
- School-based monitoring of medication effects
- Overview of school- and home-based interventions

Table C2 (continued)

Overview of Project Facilitate: An Inservice Education Program for Educators and Parents

Intervention Manual (continued):

- Practical academic, behavioral, cognitive-behavioral, social skills, self-esteem building, and attribution training activities
- Intervention model and accommodation plan

Note. Summarized from "Project Facilitate: An inservice education program for educators and parents," by L.A. Worthington, J.F. Wortham, C.R. Smith, and D. Patterson 1997, *Teacher Education and Special Education, 20*, p. 125-126.

Table C3

Overview of Striving for Compatibility: An Inservice Program for Meeting the Social Needs of ADHD Students

Phase I	Understanding students with ADHD and their social needs
	• Goals of the program
	• Types and characteristics of the disorder
	• Attention, arousal, and self-regulation
	• ADHD: A neurochemical disorder
	• Potential impacts on social functioning
	• Role of social information processing
	• Goodness of fit and compatibility arenas
	• Short term accommodations
Phase II	Responding to the social needs of students with ADHD
	• Pathways to compatibility
	• Limitation of short term accommodations
	• Coaching social behaviors
	• Guided social thinking
	• Motivating the performance of social skills
	• Thinking about compatibility

Table C3 *(continued)*

Overview of Striving for Compatibility: An Inservice Program for Meeting the Social Needs of ADHD Students

Phase III	Facilitating classroom climates conducive to prosocial learning • Need for prosocial classrooms • Strategies that foster prosocial learning opportunities • Social goals for individuals and groups • Teacher's core values and their impact on classrooms • Making the classroom more prosocial • Summary of *Striving for Compatibility* framework

Note. Summarized from "Meeting the social needs of students with AD/HD by addressing the professional development needs of their teachers," by C. Marchant and G.N. Siperstein, 1997, *Teacher Education & Special Education, 20,* p. 97.

Table C4

Overview of A Continuing Education Program on Attention-Deficit Hyperactivity Disorder

Module I	Characteristics and Identification • Historical background on ADHD • Clinical description • Diagnosis • Comorbidity • Assessment • Multicultural considerations
Module II	Model School Programs • Current research about innovative programs • Characteristics of effective school programs
Module III	Effective Classroom Interventions • Behavioral and academic interventions for the classroom setting

Table C4 *(continued)*

Overview of A Continuing Education Program on Attention-Deficit Hyperactivity Disorder

Module IV	Policy and Administrative Issues • History of legal issues • Advocacy groups • Systematic analysis of related laws

Note. Summarized from "A continuing education program on attention deficit/hyperactivity disorder," by A. Kallas, R.E. Reeve, A.B. Welch, and J.V. Wright, 1997. *Teacher Education & Special Education, 20,* p. 117-120.

APPENDIX D

Table of Contents from *ADHD in the Schools: An Educator's Training Program for the Cypress-Fairbanks ISD*

APPENDIX E

LOGIC MODEL: PROGRAM IMPLEMENTATION

RESOURCES	ACTIVITIES	OUTPUTS--SHORT	SHORT & LONG-TERM OUTCOMES	IMPACT
In order to accomplish our set of activities we will need:	*In order to address our problem or asset we will accomplish the following activities:*	*We expect that once accomplished these activities will produce the following evidence of service delivery:*	*We expect that if accomplished these activities will lead to the following changes in 1-3 and then 4-6 years:*	*We expect that if accomplished these activities will lead to the following changes in 7-10 years:*
• District support for the program • Funding from Special Education Department for the development of program • Support from Staff Development Department (accept program and give teacher credit) • Support from Director of Psychological Services to encourage psychologists to facilitate training • Support from campus teams (primarily principal)	• Develop a district-wide training program for ADHD • Advertise in staff development course catalog and/or new on-line registration system • Print educational curriculum for each campus at district central office • Launch multiple three-hour research-driven training sessions through both campus-based activities and via the staff development program to elementary and middle school staff	• # of sessions taught • # of teachers attending training sessions • Demographic data describing participants with regard to age, years of teaching, prior training and exposure to ADHD • Average # of items correct on knowledge of ADHD measure before training session • Average # of items correct on knowledge measure of ADHD after training session	Changes in 1-3 years: • Increased teacher knowledge about ADHD • Increased confidence among teachers in working with students with ADHD • Improved understanding educators' needs with regard to students with ADHD • Increased awareness among educators regarding resources for students with ADHD • Increased willingness among educators to make accommodations for	• Teachers feel confident in meeting the diverse needs of students with ADHD • Educators seek and use multiple strategies for working with students with ADHD • Staff collaborate with other district members regarding strategies to use with students with ADHD • Staff communicate with parents in more appropriate/ supportive ways regarding students with ADHD • Staff understand the neurobiological

APPENDIX E

LOGIC MODEL: PROGRAM IMPLEMENTATION (*continued*)

RESOURCES	**ACTIVITIES**	**OUTPUTS--SHORT**	**SHORT & LONG-TERM OUTCOMES**	**IMPACT**
In order to accomplish our set of activities we will need:	*In order to address our problem or asset we will accomplish the following activities:*	*We expect that once accomplished these activities will produce the following evidence of service delivery:*	*We expect that if accomplished these activities will lead to the following changes in 1-3 and then 4-6 years:*	*We expect that if accomplished these activities will lead to the following changes in 7-10 years:*
to use campus facility/resources • Willingness among psychologists, counselors, and other administrators to facilitate/implement program • Funding from Staff Development Department to pay facilitators • Need among educators to attend staff development programs to receive continuing education credits • Time allocated for staff to attend training • Accountability for	who sign up for training • Staff in attendance will: brainstorm intervention ideas, work collaboratively in small groups to plan interventions, listen to didactic information, watch a video clip, be presented with books and ADHD Resource Box as further resources of information, will work in groups to problem-solve ADHD procedure in district • Collect needs assessment	• Average rating across item on measure of perceived confidence in working with students with ADHD prior to training session • Average rating across items on measure of perceived confidence in working with students with ADHD after training session • Average satisfaction ratings of participants with regard to ADHD topics generated from needs assessment.	students with ADHD • Improved attitudes among educators toward mainstreaming of students with ADHD • Increased awareness of research-supported, effective strategies/interventions for students with ADHD • Increased comfort and knowledge among educators with the ADHD referral process • Improvement of the delivery and content of the training program to better reflect teacher needs	nature of the disorder and cease viewing the student as lazy or manipulative, thereby increasing positive perceptions of these students and their abilities • Establishment of a network among teachers/staff to increase problem-solving for difficult to teach students with ADHD • Staff have access to a district "expert"/liaison regarding additional, current research-based information on

APPENDIX E

LOGIC MODEL: PROGRAM IMPLEMENTATION (*continued*)

RESOURCES	**ACTIVITIES**	**OUTPUTS–SHORT**	**SHORT & LONG-TERM OUTCOMES**	**IMPACT**
In order to accomplish our set of activities we will need:	*In order to address our problem or asset we will accomplish the following activities:*	*We expect that once accomplished these activities will produce the following evidence of service delivery:*	*We expect that if accomplished these activities will lead to the following changes in 1-3 and then 4-6 years:*	*We expect that if accomplished these activities will lead to the following changes in 7-10 years:*
staff to attend entire program (i.e. credit contingent upon full attendance) • Ability to advertise/inform staff of session dates and times • Facility/rooms within the district to hold the sessions • Equipment and supplies provided by district (i.e. tables, projector, etc.) • Budget for photocopying handouts for participants • Program developers' accessibility to research materials to	information from targeted audience • Participants will complete research measures • Participants will complete evaluation forms presented by district staff development department regarding how the program relates to district goals.	• Average satisfaction ratings and qualitative comments of participants with regard to: overall session, content, presentation style • Amount of change in perceived confidence in working with students with ADHD among teachers after training program • Amount of change in knowledge about ADHD among teachers after training program • Data from facilitators regarding the delivery and	4-6 years: • Diminished misperceptions about ADHD and increased, accurate, knowledge about ADHD across the district • Improved delivery of the program—streamlined to meet needs of participants, the needs of the facilitators, and the goals of the stakeholders • Improved fit among teacher needs and activities of the training program	ADHD • Significant reductions in special education referrals for ADHD • Increased appropriate referrals for Section 504 services • Percentage of students identified as OHI is comparable to that of other districts our size • Increased satisfaction among parents of students with ADHD regarding school services provided to their children

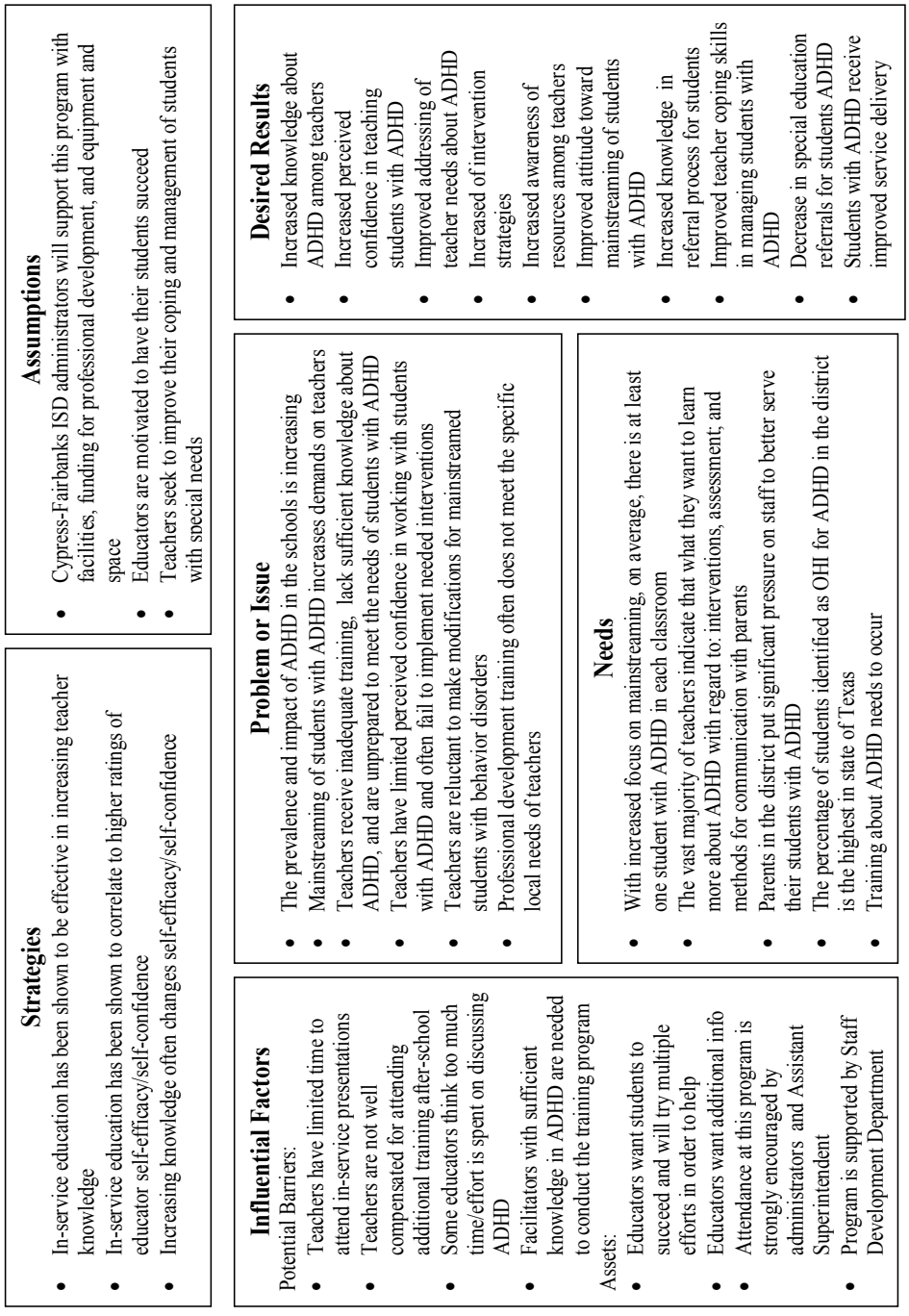
APPENDIX E

LOGIC MODEL: PROGRAM IMPLEMENTATION (*continued*)

RESOURCES	**ACTIVITIES**	**OUTPUTS--SHORT**	**SHORT & LONG-TERM OUTCOMES**	**IMPACT**
In order to accomplish our set of activities we will need:	*In order to address our problem or asset we will accomplish the following activities:*	*We expect that once accomplished these activities will produce the following evidence of service delivery:*	*We expect that if accomplished these activities will lead to the following changes in 1-3 and then 4-6 years:*	*We expect that if accomplished these activities will lead to the following changes in 7-10 years:*
derive content • Program developers' access to district staff for feedback on developed program • Time for facilitator to review and present the program • Budget to provide refreshments during in-service program		content of the training program sessions they conducted		•

APPENDIX F

LOGIC MODEL: PROGRAM PLANNING



APPENDIX G

LOGIC MODEL: EVALUATION PLANNING

Evaluation Focus Area	Audience	Question	Use
ADHD Knowledge	Stakeholders	Does the program increase teacher knowledge about ADHD?	Is the program worth implementing? Does it create positive changes?
	Stakeholders	What do educators want to learn in an ADHD in-service?	What topic areas should be included in training for teachers on ADHD?
	Stakeholders	Does the program address the needs of the participants?	Do the participants feel that the program provides what they have identified as their training needs? Relevance of program objectives/content to identified needs of participants.
	Stakeholders	What level of knowledge about ADHD do educators in our district have?	Do we need to provide training to increase knowledge of ADHD?
	Stakeholders	Does the program increase teachers' likelihood to use interventions for ADHD students?	Does the program help teachers manage students with ADHD and improve services to students with ADHD?
	Stakeholders	How committed are educators to making accommodations for students with ADHD?	Do teachers need increased understanding of how/why accommodations are necessary for success?

APPENDIX G

LOGIC MODEL: EVALUATION PLANNING (*continued*)

Evaluation Focus Area	Audience	Question	Use
	Stakeholders	Does teacher proficiency in following a referral process improve with this program?	Will the program help increase teacher knowledge with the referral process and thereby decrease inappropriate referrals?
	Stakeholders	What obstacles impede educators from making adaptations for students with ADHD?	Can these obstacles be reduced or eliminated?
	Stakeholders	Does increased knowledge of ADHD correlate with increased comfort in working with ADHD students?	Does training educators about ADHD improve their perceived confidence in working with these students?
	Stakeholders	Does teachers' comfort with ADHD students differ from paraprofessionals' comfort with ADHD students?	Who should be the target population of the ADHD training program?
	Stakeholders	How does ADHD knowledge among teachers compare to that among paraprofessionals?	Who should be the target population of the ADHD training program? Who needs it more?

APPENDIX G

LOGIC MODEL: EVALUATION PLANNING (*continued*)

Evaluation Focus Area	Audience	Question	Use
	Participants	Did the program increase teacher knowledge about ADHD?	Does the program help teachers better understand these students, their needs, and what to do to assist them?
	Participants	How will the knowledge and skills gained from the program translate to the classroom?	Practical utility and relevance
	Facilitators	What is the baseline knowledge of educators with regard to ADHD?	Helps facilitator match language and fill in knowledge where needed
Perceived confidence in working with students with ADHD	Stakeholders	How confident are educators with working with students with ADHD?	To determine if change in attitude/beliefs is warranted
	Stakeholders	Does the program increase teacher confidence in working with students with ADHD?	Is the program worth implementing—does it create positive changes?
	Stakeholder	Does confidence of teachers differ from confidence of paraprofessionals with regard to students with ADHD?	Who to target for training in future?

APPENDIX G

LOGIC MODEL: EVALUATION PLANNING (*continued*)

Evaluation Focus Area	Audience	Question	Use
	Stakeholders	In what areas does the program most greatly improve confidence (e.g., parent communication, referral process, interventions)	In what area is the biggest impact in confidence being made by this program?
	Participants	Does the program increase participant confidence in working with students with ADHD?	Will it make it easier for teachers to do their job?
Program Improvement	Stakeholders	What would improve this program regarding content? Regarding activities/style?	How could we best utilize limited resources and time? Streamline efforts in future
	Facilitators	Is enough time allocated to cover the content and objectives?	Implementation issue—can the program be adequately delivered in this way?
	Stakeholders Facilitators	Are participants satisfied with the program content and style?	Formative Information—how can the program be improved so that participants enjoy the training?

APPENDIX G

LOGIC MODEL: EVALUATION PLANNING (*continued*)

Evaluation Focus Area	Audience	Question	Use
	Stakeholders Facilitators	Did the activities help the participants achieve the intended goals?	Formative Information—how can we improve the match between the activities and desired outcomes?
	Facilitator	Was the program easy to implement? Clear? Well-organized?	Implementation Issue—can the program be well-delivered and quickly implemented by facilitators with basic knowledge about ADHD?
	Facilitators	Do participants appear to understand what is being presented?	Are the materials prepared in a way that address the needs of the intended audience?
	Facilitators Stakeholders Participants	Can the participants use good problem-solving skills and apply what they have learned to hypothetical vignettes?	Application of skills

APPENDIX H

LOGIC MODEL: INDICATORS DEVELOPMENT

Focus Area	Question	Indicators	Technical Assistance Needed
Outcomes	Does the training program increase teacher knowledge about ADHD?	Educator ADHD Knowledge Form	[Quantitative: pre/post] Scoring Key SPSSx Software
	Does the training program increase teacher perceived confidence in working with students with ADHD?	Perceived Confidence of Working with Students with ADHD Measure	[Quantitative: pre/post] SPSSx Software
	Does the training program improve attitude toward mainstreaming students with ADHD?	Teachers' Attitudes Toward Mainstreaming Students with ADHD	[Quantitative: pre/post] SPSSx Software
	What is the relationship of teacher efficacy with other outcomes?	Teacher Efficacy Scale	Correlation of post-test measure scores
Process	What do educators want to learn in an ADHD in-service?	Needs Assessment	[Qualitative—prog eval] Method of Qualitative Analysis
	Does the program address the needs of the participants?	Needs Assessment Participant Satisfaction Scale	[Qualitative— Needs Assessment Quantitative and Qualitative— Participant Satisfaction Scale]
	What would improve this program regarding content? Regarding activities/style?	Participant Satisfaction Scale	[Qualitative Analysis]

APPENDIX I

IRB# _____

Informed Consent to Participate in Research

The University of Texas at Austin

You are being asked to participate in a research study. This form provides you with information about the study. The Principal Investigator (the person in charge of this research) or his/her representative will also describe this study to you and answer all of your questions. Please read the information below and ask questions about anything you don't understand before deciding whether or not to take part. Your participation is entirely voluntary and you can refuse to participate without penalty or loss of benefits to which you are otherwise entitled.

Title of Research Study:
An Exploratory Study of the Implementation and Outcomes of a Program to Train Educators about ADHD in the Schools

Principal Investigator(s) (include faculty sponsor), UT affiliation, and Telephone Number(s):
Marina E. Niznik, M.A., Doctoral Candidate, UT Department of Educational Psychology; (281) 251-7388
Deborah Tharinger, Ph.D., Associate Professor, UT Department of Educational Psychology; (faculty sponsor) (512) 471-4155
Gary Borich, Ph.D., Professor, UT Department of Educational Psychology; (faculty sponsor) (512) 471-4155

Funding source:
Not applicable.

What is the purpose of this study?
This practice-based research will attempt to clarify whether or not teachers in the Cypress-Fairbanks ISD will benefit from inservice training on ADHD. There will be approximately 100 participants in this study.

What will be done if you take part in this research study?
Your participation in this research will involve anonymously completing several measures both prior to and after the staff development presentation on ADHD. You will not be asked to provide identifying information (such as name, social security number, employee ID number). These measures are intended to solicit information about your knowledge, confidence, and attitudes in working with students with ADHD.

The measures you will be asked to complete include: Demographic Information Form, Educator ADHD Knowledge Form, Perceived Confidence in Working with Students with ADHD Form, Teacher Attitudes Toward Mainstreaming Students with ADHD Form, Teacher Efficacy Scale, and Participant Satisfaction Scale.

What are the possible discomforts and risks?
There is no foreseeable discomfort or risk associated with your participation in this research.

What are the possible benefits to you or to others?
Your involvement in this research will provide information to the district about your satisfaction with this training and possible directions for future improvement. Additionally, you will be contributing to a knowledge base regarding teachers' knowledge, confidence, perceptions, and attitudes about ADHD.

If you choose to take part in this study, will it cost you anything?
There is no cost to you to participate in this training.

Will you receive compensation for your participation in this study?
Compensation will not be offered for participation in this study beyond the compensation that may be arranged for your participation in a district staff development program.

What if you are injured because of the study?
Not applicable.

If you do not want to take part in this study, what other options are available to you?

Participation in this study is entirely voluntary. You are free to refuse to be in the study, and your refusal will not influence current or future relationships with The University of Texas at Austin and the Cypress-Fairbanks Independent School District

How can you withdraw from this research study and who should you call if you have questions?

If you wish to stop your participation in this research study for any reason, you should contact: Marina E. Niznik, M.A. at (713) 460-7825. You are free to withdraw your consent and stop participation in this research study at any time without penalty or loss of benefits for which you may be entitled. Throughout the study, the researchers will notify you of new information that may become available and that might affect your decision to remain in the study.

In addition, if you have questions about your rights as a research participant, please contact Clarke A. Burnham, Ph.D., Chair, The University of Texas at Austin Institutional Review Board for the Protection of Human Subjects, 512/232-4383.

How will your privacy and the confidentiality of your research records be protected?
As identifying information is NOT being requested on the measures, your confidentiality will be assured. Any identifying information (such as your name on the consent form) will be kept separate from the completed measures.

Authorized persons from The University of Texas at Austin and the Institutional Review Board have the legal right to review your research records and will protect the confidentiality of those records to the extent permitted by law. If the research project is sponsored then the sponsor also has the legal right to review your research records. Otherwise, your research records will not be released without your consent unless required by law or a court order.

If the results of this research are published or presented at scientific meetings, your identity will not be disclosed.

Will the researchers benefit from your participation in this *study*?
The researcher will not be benefiting from your participation beyond the benefit of publishing the results in a doctoral dissertation.

Signatures:

As a representative of this study, I have explained the purpose, the procedures, the benefits, and the risks that are involved in this research study:

_____

Signature and printed name of person obtaining consent Date

You have been informed about this study's purpose, procedures, possible benefits and risks, and you have received a copy of this Form. You have been given the opportunity to ask questions before you sign, and you have been told that you can ask other questions at any time. You voluntarily agree to participate in this study. By signing this form, you are not waiving any of your legal rights.

_____

Printed Name of Subject Date

_____

Signature of Subject Date

_____

Signature of Principal Investigator Date

APPENDIX J

Demographic Information Form

Instructions: *Please check ONE response in each category.*

Gender:

- ☐ Male
- ☐ Female

Age:

- ☐ 18-20
- ☐ 21-30
- ☐ 31-40
- ☐ 41-50
- ☐ 51+

Current grade level that you teach:

- ☐ Kindergarten, Pre-K, or PPCD
- ☐ First Grade
- ☐ Second Grade
- ☐ Third Grade
- ☐ Fourth Grade
- ☐ Fifth Grade
- ☐ Across grade levels (*please specify which grades*_____

Job role:

- ☐ Regular Education Teacher
- ☐ Special Education Teacher
- ☐ Administrator (e.g., Principal, Assistant Principal, Instructional Specialist)
- ☐ Paraprofessional (*please specify*_____)
- ☐ Other (*please specify* _____)

Number of years of school teaching experience:_____years

Have you learned about ADHD in an educator preparation program (i.e., college courses)?

- ☐ No
- ☐ Yes, in one 1-3 hour presentation during a course
- ☐ Yes, in more than one 1-3 hour presentation during a course

Prior to today, approximately <u>how many hours</u> of training in ADHD have you received since leaving your educator training program (e.g., inservices, workshops, conferences, etc.)?

- ☐ 0
- ☐ 1-3
- ☐ 4-8
- ☐ 8-12
- ☐ 13 or more hours

What is the approximate <u>number of students</u> with suspected/diagnosed ADHD that you have taught since you have become an educator?

- ☐ 0
- ☐ 1-5
- ☐ 6-10
- ☐ 11-15
- ☐ 16-20
- ☐ 21 or more students

APPENDIX K

Educator ADHD Knowledge Form

1. What does ADHD stand for?

a. Attention-deficit/hyperactivity disorder
b. Attention deficit disorder
c. Attention/deficit and hyperactivity disorder
d. Attentional-deficit/hyperactive disorder
e. Attention-deficit/hyperactivity dysfunction

2. Breaking up a larger assignment into smaller units might be a beneficial intervention when the student with ADHD displays:

a. restless motor movement
b. inability to sustain attention to tasks
c. difficulty with peers
d. poor ability to keep track of their school supplies
e. b and d

3. The three <u>main</u> characteristics of ADHD are:

a. inattention, non-compliance, off-task behavior
b. inattention, excessive movement, vigilance
c. hyperactivity, excessive movement, lack of concentration
d. impulsivity, hyperactivity, inattention
e. inattention, learning problems, low self-esteem

4. An example of inattentive classroom behavior is:

a. playing with a pencil
b. difficulty completing tasks
c. tapping on a desk
d. blurting out answers
e. frequently being out of seat

5. Typical treatment options for ADHD often include all of the following except:

a. medication
b. behavior modification
c. classroom modifications
d. parent training
e. increased participation in sports

6. <u>Approximately</u> how many students in the United States currently have ADHD?

a. 7 students in every classroom
b. 20% of the entire population
c. 3-5% of the student population
d. 1 student per classroom
e. c and d

7. Which of the following is <u>not</u> a subtype of ADHD, as delineated in the Diagnostic and Statistical Manual—Fourth Edition (DSM-IV)?

a. hyperactive-impulsive subtype
b. inattentive subtype
c. combined subtype
d. non-hyperactive subtype
e. c and d

8. In assessing students for ADHD in the school setting, which of the following is true?

a. A diagnosis can be made by school personnel by looking at the results of rating scales alone.
b. A diagnosis can be made from multiple, carefully conducted classroom observations, alone.
c. In addition to determining the presence of symptoms, educational need must be established.
d. Only the presence of symptoms within the school environment is of concern.
e. It is not necessary to consider the severity of the symptoms.

9. Under the Individuals with Disabilities Education Act (IDEA), a student diagnosed with ADHD who is having significant difficulties at school due to the symptoms of his/her disability might be eligible for services as a student with:

a. a learning disability (LD)
b. a behavior disability (BD)
c. an other health impairment (OHI)
d. an attentional/hyperactive disability (AHD)
e. an emotional disturbance (ED)

10. Which of the following statements is true about ADHD?

a. ADHD was first identified in 1960.
b. ADHD in now more commonly called ADD.
c. The characteristics of this disorder have been observed for over 100 years.
d. The DSM-IV was the first publication that identified this disorder for diagnosis.
e. A student diagnosed with ADHD can also be concurrently diagnosed with Hyperkinetic Reaction of Childhood.

11. Which of the following does <u>not</u> often co-occur with ADHD?

a. learning problems
b. mobility problems
c. emotional problems
d. behavior problems
e. social skills problems

12. Regarding treatment of ADHD, recent research results that emerged from the largest treatment study to date have demonstrated that:

a. behavioral treatment alone is the **most** effective intervention
b. family therapy combined with medication management is the **most** effective intervention
c. social skills treatment combined with behavioral treatment is the **most** effective intervention
d. medication management alone is the **least** effective intervention
e. medication management combined with behavioral treatment is the **most** effective intervention

13. Which class of medication do physicians often <u>first</u> try when treating students with ADHD?

a. tricyclic antidepressants
b. psychostimulants
c. antipsychotics
d. atypical antidepressants
e. antihypertensives

14. When a regular education student requires additional school support due to difficulties associated with characteristics of ADHD, which of the following should be tried <u>first</u>?

a. special education services
b. referral for psychological services
c. modifications within the classroom
d. medication management
e. referral for OHI

15. Students with ADHD perform best in classrooms that offer:

a. structure
b. predictability
c. varied teaching methods
d. all of the above
e. a and c only

16. The most common side effects of stimulant medications are:

a. increased appetite and reduced motor activity
b. headaches, stomachaches, and growth spurts
c. decreased appetite and temporary growth suppression
d. insomnia and "spacey" or "zoned out" behavior
e. increased anxiety and increased appetite

17. In the Cypress-Fairbanks ISD, if an educator would like additional information on ADHD he or she can:

a. consult the ADHD Resource Box located on each campus
b. consult with the school counselor
c. call national and local organizations associated with ADHD
d. consult the ADHD liaison on each campus
e. a, b, and c

18. Which of the following medications does <u>not</u> belong to the stimulant class of medications?

a. Ritalin
b. Concerta
c. Adderall
d. Prozac
e. Dexedrine

19. The disorder presently known as attention-deficit/hyperactivity disorder has previously been known as which of the following?

a. minimal brain dysfunction
b. attention deficit disorder
c. hyperkinetic reaction of childhood
d. all of the above
e. a and c only

20. Regarding services in the schools for students with ADHD, which of the following is true?

a. All students diagnosed with ADHD should receive special education services as students with an Other Health Impairment (OHI).
b. All students diagnosed with ADHD should be referred for services through Section 504 of the Rehabilitation Act.
c. All students diagnosed with ADHD who are performing poorly at school due to the symptoms of their disorder, should be considered for special services.
d. All students who are suspected of having ADHD should be immediately referred for a Full Individual Evaluation by both the campus diagnostician and school psychologist.
e. There are no mandated services in the schools for students with ADHD.

21. Which of the following is <u>not</u> implicated by current research as a potential cause of ADHD?

a. heredity
b. neuroanatomical brain differences
c. biological response to sugar consumption
d. DNA
e. brain neurotransmitters

22. In the Cypress-Fairbanks ISD, when a parent initiates a concern with a classroom teacher regarding their student's ADHD-type behavior, what typically precedes a referral for Section 504 services and/or special education services?

a. The teacher informs and discusses the case with the school counselor
b. School staff determine if there is an educational need for services
c. The counselor or psychologist distribute parent and teacher rating scales
d. a and c only
e. a, b, and c

23. Regarding intervention strategies to help remedy school difficulties associated with ADHD, which of the following statements is true?

a. To implement interventions in the classroom for a student with ADHD, he/she must first be identified as a student in special education.
b. Prior to a teacher being able to implement interventions in the classroom for a student with ADHD the school psychologist must be informed.
c. There is a district list of acceptable interventions for students with ADHD that must be consulted prior to initiating any classroom interventions.
d. Teachers can use their own judgment in selecting potentially helpful interventions to use with students with ADHD.
e. The private physician who diagnosed the student's ADHD must always give his/her approval for the proposed interventions.

APPENDIX L

ANSWER KEY TO EDUCATOR ADHD KNOWLEDGE FORM

1. A
2. B
3. D
4. B
5. E
6. E
7. D
8. C
9. C
10. C
11. B
12. E
13. B
14. C
15. D

APPENDIX L (*continued*)

ANSWER KEY TO EDUCATOR ADHD KNOWLEDGE FORM

16. C

17. E

18. D

19. D

20. C

21. C

22. E

23. D

APPENDIX M

Perceived Confidence in Working with Students with ADHD

Instructions: Please rate your confidence for successfully performing each goal or activity on a scale of (1) *no confidence* to (5) *strong confidence.*

1= no confidence
2=a little confidence
3=sufficient confidence
4=quite a bit of confidence
5=strong confidence

1. Create a classroom environment in which students with ADHD feel accepted	1 2 3 4 5
2. Set up my room so that behavior problems are minimized	1 2 3 4 5
3. Foster acceptance and understanding in classmates who may be critical or mean to students with ADHD	1 2 3 4 5
4. Teach in such a way that students with ADHD can learn in the classroom	1 2 3 4 5
5. Determine when a student with ADHD manifests behavior requiring intervention	1 2 3 4 5
6. Determine when progress is made in the behavior of a student with ADHD	1 2 3 4 5
7. Adjust lessons or materials for students with ADHD	1 2 3 4 5
8. Communicate effectively regarding concerns to parents of students with ADHD	1 2 3 4 5
9. Set up an effective behavior contract with a student with ADHD	1 2 3 4 5
10. Manage stress caused by students with ADHD in the classroom	1 2 3 4 5

Reid, R., Vasa, S.F., Maag, J.W., & Wright, G. (1994). An analysis of teachers' perceptions of attention deficit-hyperactivity disorder. *The Journal of Research and Development in Education, 27* (3), 195-202.

APPENDIX N

Teachers' Attitudes Toward Mainstreaming Students with ADHD

Instructions: Please rate your belief for each statement below using the following scale:

1=strongly disagree
2=disagree
3=neither agree nor disagree
4=agree
5=strongly agree

1. I support mainstreaming for students with ADHD	1 2 3 4 5
2. I believe that mainstreaming has been beneficial for students with ADHD	1 2 3 4 5
3. I believe that the mainstreaming of students with ADHD has been beneficial to non-disabled students in mainstream classes	1 2 3 4 5
4. I believe that mainstreaming has been successful in terms of how others view students with ADHD	1 2 3 4 5
5. I believe that mainstreaming has been successful in terms of improving the social skills of students with ADHD	1 2 3 4 5
6. I believe that mainstreaming has been successful in terms of improving the academic skills of students with ADHD	1 2 3 4 5
7. I believe that mainstreaming has been successful in terms of improving the emotional functioning of students with ADHD	1 2 3 4 5
8. I believe that mainstreaming has been successful in terms of improving the school work habits of students with ADHD	1 2 3 4 5
9. I believe that mainstreaming has been successful in terms of improving the classroom behavior of students with ADHD	1 2 3 4 5
10. I believe that mainstreaming in my school has been successful	1 2 3 4 5
11. I believe that students with ADHD should be referred for special programs (i.e. Special Education, Section 504 services)	1 2 3 4 5

Adapted from: Bender, W.N. & Vail, C.O. (1995). Teachers' attitudes toward increased mainstreaming. *Journal of Learning Disabilities, 28* (2), 87-96.

APPENDIX O

Teacher Efficacy Scale

Instructions: Please indicate the degree to which you agree or disagree with each statement below by circling the appropriate number to the right of each statement.

1=strongly agree
2=agree
3=disagree
4=strongly disagree

1. As hard as I try, I have trouble improving really bad student behavior	1 2 3 4
2. When I really try, I can get through to the most difficult students	1 2 3 4
3. All other factors considered, my own influence on student achievement in not very significant	1 2 3 4
4. I can handle virtually any learning problem well	1 2 3 4
5. I do have significant influence on the progress of students	1 2 3 4
6. I become truly discouraged when I see a student reengaging in problem behavior	1 2 3 4
7. I am able to successfully teach even a poorly motivated student	1 2 3 4
8. When a student does better than usual, it is often because I taught him/her especially well	1 2 3 4
9. I am good at reducing the problem behaviors of students	1 2 3 4
10. Whenever my students learn faster than usual it is because I have arranged instruction more effectively	1 2 3 4
11. My contribution to student achievement is rather small	1 2 3 4

Meijer, C.J.W., & Foster, S.F. (1988). The effect of teacher self-efficacy on referral chance. *The Journal of Special Education, 22* (3), 378-385.

APPENDIX P

Participant Satisfaction Form

Part A Instructions: Please indicate to what extent today's training has met your needs in each area listed below by using the scale provided.

1=not at all 2=a little 3=enough 4=very well 5=extremely well

1. Characteristics of ADHD	**1**	**2**	**3**	**4**	**5**
2. Ways to recognize ADHD	**1**	**2**	**3**	**4**	**5**
3. Causes of ADHD	**1**	**2**	**3**	**4**	**5**
4. Prevalence of ADHD	**1**	**2**	**3**	**4**	**5**
5. Developmental course of ADHD	**1**	**2**	**3**	**4**	**5**
6. Medication	**1**	**2**	**3**	**4**	**5**
7. Strategies to increase motivation	**1**	**2**	**3**	**4**	**5**
8. Strategies to improve discipline	**1**	**2**	**3**	**4**	**5**
9. Strategies to improve classroom behavior	**1**	**2**	**3**	**4**	**5**
10. Strategies to increase attention and focus	**1**	**2**	**3**	**4**	**5**
11. Strategies to increase work productivity	**1**	**2**	**3**	**4**	**5**
12. Strategies to improve organizational skills	**1**	**2**	**3**	**4**	**5**
13. Strategies to teach self management	**1**	**2**	**3**	**4**	**5**
14. Strategies to improve social skills	**1**	**2**	**3**	**4**	**5**
15. Collaborating with parents regarding ADHD	**1**	**2**	**3**	**4**	**5**
16. Helping parents improve parenting skills in managing their children with ADHD	**1**	**2**	**3**	**4**	**5**
17. As a school representative, boundaries as to what to say to parents regarding ADHD	**1**	**2**	**3**	**4**	**5**
18. Improving teachers' coping with students with ADHD	**1**	**2**	**3**	**4**	**5**
19. Awareness of district support for students with ADHD	**1**	**2**	**3**	**4**	**5**
20. Awareness of referral process for students with ADHD	**1**	**2**	**3**	**4**	**5**
21. General information about ADHD	**1**	**2**	**3**	**4**	**5**
22. New research about ADHD	**1**	**2**	**3**	**4**	**5**
23. How to manage own family's issues with ADHD	**1**	**2**	**3**	**4**	**5**

Part B Instructions: Please rate each item and <u>explain</u> your rating.

- **Please rate the <u>overall</u> training session:**

1	2	3	4	5
unsatisfactory	needs improvement	satisfactory	good	very good

Explain your rating: _____

_____

- **Please rate the overall <u>content</u> of the presentation:**

1	2	3	4	5
unsatisfactory	needs improvement	satisfactory	good	very good

Explain your rating: _____

_____

- **Please rate the <u>presentation style</u>:**

1	2	3	4	5
unsatisfactory	needs improvement	satisfactory	good	very good

Explain your rating: _____

_____

- **Would you recommend this session to others?**

1	2	3	4	5
definitely would not	probably would not	might or might not	probably would	definitely would

Explain your rating: _____

_____

- **What changes would you suggest to improve this training program?**

_____

_____

REFERENCES

Allinder, R.M. (1994). The relationship between efficacy and the instructional practices of special education teachers and consultants. *Teacher Education and Special Education, 17* (2), 86-95.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders (4th ed.)*. Washington, DC: Author.

Arnold, L.E., Abikoff, H.B., Cantwell, D.P., Conners, C.K., Elliott, G., Greenhill, L.L., Hechtman, L., Hinshaw, S.P., Hoza, B., Jensen, P.S., Kraemer, H.C., March, J.S., Newcorn, J.H., Pelham, W.E., Richters, J.E., Schiller, E., Sever, J.B., Swanson, J.M., Vereen, D., & Wells, K.C. (1997). National Institute of Mental Health Collaborative multimodal treatment study of children with ADHD (the MTA): Design challenges and choices. *Archives of General Psychiatry, 54*, 865-870.

Bacon, E.H., & Schulz, J.B. (1991). A survey of mainstreaming practices. *Teacher Education and Special Education, 14*, 144-149.

Baker, J.M., & Zigmond, N. (1990). Are regular education classes equipped to accommodate students with learning disabilities? *Exceptional Children, 56*, 515-526.

Barkley, R.A. (1990). *Attention deficit hyperactivity disorder: A handbook for diagnosis and treatment*. New York: Guilford Press.

Barkley, R.A. (1998). *Attention-deficit/hyperactivity disorder: A handbook for diagnosis and treatment* (2nd ed.). New York: Guilford Press.

Barkley, R.A., Fischer, M., Edelbrock, C.S., & Smallish, L. (1990). The adolescent outcome of hyperactive children diagnosed by research criteria: I. An 8 year prospective follow-up study. *Journal of the American Academy of Child and Adolescent Psychiatry, 29* (4), 546-557.

Bender, W.N. (1985). The case against mainstreaming: Empirical support for the political backlash. *Education, 105*, 279-287.

Bender, W.N., & Ukije, I.C. (1989). Instructional strategies in mainstream classes: Prediction of the strategies teachers select. *Remedial and Special Education, 10* (2), 23-30.

Bender, W.N., & Vail, C.O. (1995). Teachers' attitudes toward increased mainstreaming: Implementing effective instruction for students with learning disabilities. *Journal of Learning Disabilities, 28* (2), 87-96.

Biederman, J., Newcorn, J., & Sprich, S. (1991). Comorbidity of attention deficit hyperactivity disorder with conduct, depressive, anxiety, and other disorders. *American Journal of Psychiatry, 148* (5), 564-577.

Bos, C.S., Nahmias, M., & Urban, M.A. (1997). Implementing interactive professional development in a workshop course on educating students with AD/HD. *Teacher Education & Special Education, 20* (2), 132-145.

Bradley-Klug, K.I., Shapiro, E.S., & DuPaul, G.J. (1997). Attention deficit

hyperactivity disorder and kids in the middle: A field test of a school-based consultation model. *Teacher Education and Special Education, 20* (2), 179-188.

Brook, U., Watemberg, N., & Geva, D. (2000). Attitude and knowledge of attention deficit disorder and learning disability among high school teachers. *Patient Education and Counseling*, *40* (3), 247-252.

Brownell, M.T., & Pajares, F.M. (1999). The influence of teachers' efficacy beliefs on perceived success in mainstreaming students with learning and behavioral problem: A path analysis. (ERIC Document Reproduction Service No. ED 409 661).

Buell, M.J., Hallam, R., & Gamel-McCormick (1999). A survey of general and special education teachers' perceptions and inservice needs concerning inclusion. *International Journal of Disability, Development and Education, 46* (2), 143-156.

Burcham, B., Carlson, L., & Milich, R. (1993). Promising school-based practices for students with attention deficit disorder. *Exceptional Children, 60* (2), 174-180.

Children with Attention Deficit Disorders (CH.A.D.D.). (1992). Testimony to the Senate and U.S. House of Representatives Subcommittee on Appropriations. *The Ch.A.D.D.E.R. Box, 6,* 24.

Cohen, M., Becker, M.G., & Campbell, R. (1990). Relationships among

four methods of assessment of children with attention-deficit hyperactivity disorder. *Journal of School Psychology, 28*, 189-202.

Coladarci, T., & Breton, W.A. (1997). Teacher efficacy, supervision, and the special education resource-room teacher. *The Journal of Educational Research, 90* (4), 230-239.

Colvin, G., Kameenui, E., & Sugai, G. (1994). Reconceptualizing behavior management and school-wide discipline in general education. *Education and Treatment of Children, 16*, 361-381.

Cypress-Fairbanks Independent School District (2003-04). *Profile: A view of Cypress-Fairbanks Independent School District*. Houston, TX: Public Information Department.

Danielson, L., Henderson, K., & Schiller, E. (2002). Educational policy: Education of children with attention deficit hyperactivity disorder. In P.S. Jensen & J.R. Cooper (Eds.), *Attention deficit hyperactivity disorder: State of the science*. New Jersey: Civic Research Institute.

Davila, R.R., Williams, M.L., & MacDonald, J.T. (1991). *Memorandum to chief state school officers re: Clarification of policy to address the needs of children with attention deficit disorder with general and/or special education*. Washington, DC: U.S. Department of Education.

Downing, J.E., Ryndak, D.L., & Clark, D. (2000). Paraeducators in inclusive classrooms. *Remedial and Special Education, 21* (3), 171-181.

Duncan, B., Forness, S.R., & Hartsough, C. (1995). Students identified as seriously emotionally disturbed in day treatment classrooms: Cognitive, psychiatric, and special education characteristics. *Behavioral Disorders, 20*, 238-252.

DuPaul, G.J., & Eckert, T.L. (1997). The effects of school-based interventions for Attention-Deficit/Hyperactivity Disorder: A meta-analysis. *School Psychology Review, 26* (1), 5-27.

DuPaul, G.J., & Stoner, G. (1994). *ADHD in the schools: Assessment and intervention strategies*. New York: Guilford Press.

DuPaul, G.J., Stoner, G., & O'Reilly, M.J. (2002). Best practices in classroom interventions for attention problems. In A. Thomas & J.Grimes (Eds.), *Best Practices in School Psychology* (4th ed.). MD: National Association of School Psychologists.

Ecoff, E.R. (1992). *Attention deficit disorder: Meeting individual needs: A program designed to increase teacher effectiveness and promote student learning*. Florida: Nova University. (ERIC Document Reproduction Services NO. ED 351 813).

Elliott, S.N. (1986). Children's ratings of the acceptability of classroom interventions for misbehavior: Findings and methodological considerations. *Journal of School Psychology, 24*, 23-35.

Elliot, S.N. (1988). Acceptability of behavioral treatments: Review of

variables that influence treatment selection. *Professional Psychology: Research and Practice, 19*, 68-80.

Forness, S.R., & Kavale, K.A. (2002). Impact of ADHD on school systems. In P.S. Jensen & J.R. Cooper (Eds.), *Attention Deficit Hyperactivity Disorder: State of the Science, Best Practices*. New Jersey: Civic Research Institute.

Forness, S.R., Kavale, K.A., King, B.H., & Kasari, C. (1994). Simple versus complex conduct disorders: Identification and phenomenology. *Behavioral Disorders, 19*, 306-312.

Fowler, M. (1992). *CH.A.D.D. educators manual*. Plantation, FL: CH.A.D.D.

Fuchs, D., & Fuchs, L.S. (1994). Inclusive schools movement and the realization of special education reform. *Exceptional Children, 60*, 294-309.

Fuchs, D., Fuchs, L.S., Bahr, M.W., Fernstrom, P., & Stecher, P.M. (1990). Prereferral intervention: A prescriptive approach. *Exceptional Children, 56*, 493-513.

Garvar-Pinhas, A., & Schmelkin, L.P. (1989). Administrators' and teachers' attitudes toward mainstreaming. *Remedial and Special Education, 10* (4), 38-43.

Gelzheiser, L.M. (1990). Reducing the number of students identified as

learning disabled: A question of practice, philosophy, or policy? In S.B., Sigmon (Ed.), *Critical voices in special education: Problems and progress concerning the mildly handicapped* (pp. 43-50). Albany State University of New York Press.

Ghaith, G., & Yaghi, H. (1997). Relationships among experience, teacher efficacy, and attitudes toward the implementation of instructional innovation. *Teaching and Teacher Education*, *13* (4), 451-458.

Giangreco, M.F., Broer, S.M., & Edelman, S.W. (2002). "That was then, this is now!" Professional supports for students with disabilities in general education classrooms. *Exceptionality, 10* (1), 47-64.

Gibson, S., & Dembo, M.H. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology*, *76* (4), 569-582.

Gjone, H., Sundet, J.M., & Stevenson, J. (1999). Genetic influence on parent-reported attention-related problems in Norwegian general population twin sample. *Journal of the American Academy of Child and Adolescent Psychiatry, 35* (5), 588-597.

Glass, C.S., & Wegar, K. (2000). Teacher perceptions of the incidence and management of attention deficit hyperactivity disorder. *Education, 121* (2), 412-421.

Greene, R.W. (1997). Students with ADHD in school classrooms: Teacher factors related to compatibility, assessment, and intervention. In

D.L. Smallwood (Ed.), *Attention disorders in children: Resources for school psychologists.* Washington, DC: National Association of School Psychologists.

Greenhill, L.L. (November 16-18, 1998). *Stimulant medications*. Paper presented at the NIH Consensus Development Conference on Diagnosis and Treatment of Attention Deficit Hyperactivity Disorder. William H. Natcher Conference Center. National Institutes of Health.

Guskey, T.R. (1988). Teacher efficacy, self-concept, and attitudes toward the implementation of instructional innovation. *Teaching and Teacher Education, 4*, 63-69.

Guskey, T.R., & Passaro, P.D. (1994). Teacher efficacy: A study of construct dimensions. *American Educational Research Journal, 31* (3), 627-643.

Haladyna, T.M. (1997). *Writing test items to evaluate higher order thinking*. Boston: Allyn & Bacon.

Hakola, S. (1992). Legal rights of student with attention deficit disorder. *School Psychology Quarterly, 7*, 285-297.

Happe, D. (1983). Behavioral intervention: It doesn't do any good in your briefcase. In J. Grimes (Ed.), *Psychological approaches* (pp. 15-45). Des Moines, IA: Iowa State Department of Education.

Harris, B. (1989). *Inservice education for staff development*. Boston:

Allyn and Bacon.

Hawkins, J., Martin, S., Blanchard, K.M., & Brady, M.P. (1991). Teacher perceptions, beliefs, and interventions regarding children with attention deficit disorder. *Action in Teacher Education, 13* (2) 52-59.

Hawley, W. & Rosenholz, S. (1994). Good schools: What research says about improving student achievement. *Peabody Journal of Education, 61* (4), 117-123.

Henson, R.K. (2001). The effects of participation in teacher research on teacher efficacy. *Teaching and Teacher Education, 17*, 819-836.

Henson, R.K., Kogan, L.R., & Vacha-Haase, T. (2001). A reliability generalization study of the teacher efficacy scale and related instruments. *Educational and Psychological Measurement, 61* (3), 404-420.

Hinshaw, S.P. (2003). Is ADHD an impairing condition in childhood and adolescence? In P.S. Jensen & J.R. Cooper (Eds.), *Attention Deficit Hyperactivity Disorder: State of the Science, Best Practices*. New Jersey: Civic Research Institute.

Hinshaw, S.P., March, J.S., Abikor, H., Arnold, L.E., Cantwell, D.P., Conners, C.K., Elliott, G.R., Halperin, J., Greenhill, L., Hechtman, L.T., Hoza, B., Jensen, P.S., Newcorn, J.H., McBurnett, K., Pelham, W.E., Richter, J.E., Severe, J.B., Schiller, E., Swanson, J., Vereen, D., Wells, K., & Wigal, T. (1997). Comprehensive assessment of childhood attention-

deficit hyperactivity disorder in the context of a multisite, multimodal clinical trial. *Journal of Attention Disorders, 1* (4), 217-234.

Hirsch, E., Koppich, J.E., & Knapp, M.S. (1998). *What states are doing to improve the quality of teaching. A brief review of current patterns and trends.* (ERIC Document Reproduction Services No. ED 427 007).

Hocutt, A.M., McKinney, J.D., & Montague, M. (1993). Issues in the education of children with attention deficit disorder. *Exceptional Children, 60* (2), 103-106.

Hunt, P., & Goetz, L. (1997). Research on inclusive educational programs, practices, and outcomes for students with severe disabilities. *Journal of Special Education, 31*, 329.

Jerome, L., Washington, P., Laine, C.J., & Segal, A. (1999). Graduating teachers' knowledge and attitudes about attention-deficit hyperactivity disorder: A comparison with practicing teachers. *Canadian Journal of Psychiatry, 44* (2), 192-197.

Kallas, A., Reeve, R.E., Welch, A.B., & Wright, J.V. (1997). A continuing education program on attention deficit/hyperactivity disorder. *Teacher Education & Special Education, 20* (2), 114-122.

Kameenui, E.J., & Simmons, D. C (1990). *Designing instructional strategies: The prevention of academic learning problems*. Columbus, OH: Merrill.

Kaufman, J.M., Gerber, M.M., & Semmel, M.I. (1998). Arguable assumptions underlying the Regular Education Initiative. *Journal of Learning Disabilities, 21*, 6-11.

Kearney, C.A., & Durand, V.M. (1992). How prepared are our teachers for mainstreamed classroom settings? A survey of postsecondary schools of education in New York State. *Exceptional Children, 59*, 6-11.

Kellogg Foundation. (1998). *Evaluation handbook*. Battle Creek, MI: Author.

Kellogg Foundation. (2000). *Logic model development guide*. Battle Creek, MI: Author.

Kotkin, R.A. (1995). The Irvine paraprofessional program: Using paraprofessional in serving students with ADHD. *Intervention in School and Clinic, 30* (4), 235-240.

Laine, S.W.M., & Otto, C. (2000). *Professional development in education and the private sector: Following the leaders*. Illinois: NCREL.

Madden, N.A., & Slavin, R.E. (1983). Mainstreaming students with mild handicaps: Academic and social outcomes. *Review of Educational Research, 53* (4), 519-569.

Marchant, C., & Siperstein, G.N. (1997). Meeting the social needs of students with AD/HD by addressing the professional development needs of their teachers. *Teacher Education & Special Education, 20* (2), 92-102.

McIntyre, T.C. (1985). The effects of mandated course work on meeting

the intent of Illinois House Bill 150. *ICEC Quarterly, 34* (2), 25-27.

Meijer, C.J.W., & Foster, S.F. (1988). The effect of teacher self-efficacy on referral chance. *The Journal of Special Education, 22* (3), 378-385.

Minke, K.M., & Bear, G.G. (1996). Teachers' experiences with inclusive classrooms: Implications for special education reform. *Journal of Special Education, 30* (2), 152-187.

Montague, M., Warger, C., & Harris, J. (1997). A staff development program in attention deficit hyperactivity disorder. *Teacher Education & Special Education, 20* (2), 103-113.

MTA Cooperative Group. (1999a). A 14-month randomized clinical trial of treatment strategies for attention-deficit/hyperactivity disorder. *Archives of General Psychiatry, 56*, 1073-1086.

MTA Cooperative Group. (1999b). Moderators and mediators of treatment response for children with attention-deficit/hyperactivity disorder. *Archives of General Psychiatry, 56*, 1088-1096.

Munson, S.M. (1986). Regular education teacher modifications for mainstreamed mildly handicapped students. *The Journal of Special Education, 20*, 489-502.

National Joint Committee on Learning Disabilities (1988). Inservice programs in learning disabilities. *Journal of Learning Disabilities, 21*, 53-55.

North Central Regional Educational Laboratory (NCREL) (1999). Available online: http://www.ncrel.org/inofr/quality/

Patton, M. Q. (2000). Utilization-focused evaluation. In D.L. Stufflebeam, G.F. Madaus, & T. Kellaghan (Eds.), *Evaluation Models: Viewpoints on education and human services evaluation. Boston: Kluwer Academic Publishers.*

Patton, J.M., & Braithwaite, R. (1990). Special education certification/recertification for regular educators. *The Journal of Special Education, 24*, 117-124.

Pelham, W.E. (1982). Childhood hyperactivity: Diagnosis, etiology, nature, and treatment. In R. Gatchel, A. Baum, & J. Singer (Eds.), *Behavioral medicine and clinical psychology: Overlapping discipline* (pp. 261-327). Hillsdale, NJ: Erlbaum.

Pelham, W.E., Evans, S.W., Gagny, E.M., & Gresslade, K.E. (1992). Teacher ratings of DSM-IIIR symptoms for the disruptive behavior disorders: Prevalence, factor analyses, and conditional probabilities in a special education sample. *School Psychology Review, 21* (2), 285-299.

Pfiffner, L.J., & Barkley, R.A., (1990). Educational placement and classroom management. In R.A. Barkley (Ed.), *Attention deficit hyperactivity disorder: A handbook for diagnosis and treatment*

(pp. 498-539). New York: Guilford Press.

Pfiffner, L.J., & Barkley, R.A. (1998). Treatment of ADHD in school settings. In R.A. Barkley (Ed.), *Attention deficit hyperactivity disorder: A handbook for diagnosis and treatment* (2nd ed.) (pp. 458-490). New York: Guilford Press.

Piccolo-Torsky, J. & Waishwell, L. (1998). Teachers' knowledge and attitudes regarding Attention Deficit Disorder. *ERS Spectrum, 16*, 36-40.

Pisecco, S., Huzinec, C., & Curtis, D. (2001). The effect of child characteristics on teachers' acceptability of classroom-based behavioral strategies and psychostimulant medication for the treatment of ADHD. *Journal of Clinical Child Psychology, 30*, 413-421.

Pliszka, S.R., Carlson, C.L., & Swanson, J.M. (1999). *ADHD with comorbid disorders: Clinical assessment and management*. New York: Guilford Press.

Podell, D.M., & Soodak, L.C. (1993). Teacher efficacy and bias in special education referrals. *Journal of Educational Research, 86* (4), 247-253.

Reed, F., & Monda-Amaya, L.E. (1995). Preparing preservice general educators for inclusion: A survey of teacher preparation programs in Illinois. *Teacher Education and Special Education, 18* (4), 262-274.

Reid, R., Vasa, S.F., Maag, J.W., & Wright, G. (1994). An analysis of

teachers' perceptions of attention deficit-hyperactivity disorder. *Journal of Research and Development in Education, 27* (3), 195-202.

Richters, J.E., Arnold, L.E., Jensen, P.S., Abikoff, H., Conners, C.K., Greenhill, L.L, Hechtman, L., Hinshaw, S.P., Pelham, W.E., & Swanson, J.M. (1995). NIMH collaborative multisite multimodal treatment study of children with ADHD: I. Background and rationale. *Journal of the American Academy of Child and Adolescent Psychiatry, 34*, 987-1000.

Ross, J. (1994). The impact of an inservice to promote cooperative learning on the stability of teacher efficacy. *Teaching and Teacher Education, 10* (4), 381-394.

Ross, J. (1995). Strategies for enhancing teachers' beliefs in their effectiveness: Research on a school improvement hypothesis. *Teachers College Record, 97* (2), 227-252.

Ryndak, D.L., Jackson, L., & Billingsley, F. (2000). Defining school inclusion for students with moderate to severe disabilities. *Exceptionality, 8* (2), 101-116.

Sanholtz, J. H. (1999). *A comparison of direct and indirect professional development activities*. Paper presented at the 1999 meeting of the American Educational Research Association, Montreal, Canada.

Schaub, J.M. (1998). *Your kid has ADHD, now what?* Minnesota: Beaver's Pond Press.

Schmuck, R.A. (1990). Organizational development in schools: Contemporary concepts and practices. In T.B. Gutkin & C.R. Reynolds (Eds.), *The handbook of school psychology* (2nd ed.)., New York: John Wiley & Sons.

Schumm, J.S., & Vaughn, S. (1991). Making adaptations for mainstreamed students: General classroom teachers' perspectives. *Remedial & Special Education, 12* (4), 18-27.

Schumm, J.S., & Vaughn, S. (1992). Planned for mainstreamed special education students: Perceptions of general education teachers. *Exceptionality, 3* (2), 81-98.

Schumm, J.S., & Vaughn, S. (1995). Meaningful professional development in accommodating students with disabilities. *Remedial & Special Education, 16* (6), 1-15.

Schumm, J.S., Vaughn, S., Gordon, J., & Rothlein, L. (1994). General education teachers' beliefs, skills, and practices in planning for mainstreamed students with learning disabilities. *Teacher Education and Special Education, 17* (1), 22-37.

Sciutto, M.J., Terjesen, M.D., & Frank, A.S.B. (2000). Teachers' knowledge and misperceptions of attention-deficit/hyperactivity disorder. *Psychology in the Schools, 37* (2), 115-122.

Scruggs, T.E., & Mastropieri, M.A. (1996). Teacher perceptions of

mainstreaming/inclusion, 1958-1995: A research synthesis. *Exceptional Children, 63*, 59-74.

Semmel, M.I., Abernathy, T.V., Butera, G., & Lesar, S. (1991). Teacher perceptions of the regular education initiative. *Exceptional Children, 58*, 9-25.

Smith,T.E., Polloway, E.A., Patton, J.R., & Dowdy, C.A. (1995). *Teaching students with special needs in inclusive settings*. Boston: Allyn & Bacon.

Soodak, L.C., & Podell, D.M. (1993). Teacher efficacy and student problems as factors in special education referral. *Journal of Special Education, 27*, 66-81.

Soodak, L.C., & Podell, D.M. (1996). Teacher efficacy: Toward the understanding of a multi-faceted construct. *Teaching and Teacher Education, 12* (4), 401-411.

Soodak, L.C., & Podell, D.M. (1998). Teacher, student, and school attributes as predictors of teachers' responses to inclusion. *Journal of Special Education,* 31 (4), 1-16.

Stormont, M., & Stebbins, J.S. (2001). Teachers' comfort and importance ratings for interventions for preschoolers with AD/HD. *Psychology in the Schools, 38* (3), 259-267.

Stein, M., & Wang, M. (1988). Teacher development and school improvement: The process of teacher change. *Teaching and*

Teacher Education, 4, 171-187.

Swartz, C., Hooper, S.R., Gut, D.M., Wakely, M.B., & Levine, M.D. (1997). Sharing the language of attention deficits: Educational programs about attention for parents, their children and professionals. *Teacher Education & Special Education, 20* (2), 163-169.

Teeter, P.A. (1998) *Interventions for ADHD: Treatment in developmental context.* New York: Guilford Press.

Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education, 17* (7), 783-805.

Tschannen-Moran, M., Woolfolk Hoy, A. & Hoy, W.K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research, 68* (2), 202-248.

Weiss, G., & Hechtman, L.T. (1993). *Hyperactive children grown up: ADHD in children, adolescents, and adults*. New York: Guilford Press.

Wender, P. (1995). *Attention-deficit hyperactivity disorder in adults*. New York: Oxford University Press.

Wheatley, K.F. (2002). The potential benefits of teacher efficacy doubts for educational reform. *Teaching and Teacher Education, 18* (1), 5-22.

Whinnery, K., Fuchs, L., & Fuchs, D. (1991). General, special, and

remedial teachers' acceptance of behavioral and instructional strategies for mainstreaming students with mild handicaps. *Remedial and Special Education, 12* (4), 6-17.

Wilczenski, F.L. (1992). Reevaluating the factor structure of the attitudes toward mainstreaming scale. *Educational and Psychological Measurement, 52*, (2), 499-505.

Wilson, M.S. (1991). Support services professional's evaluation of current services for students with learning disabilities and low achieving students without learning disabilities: More grist for the reform mill. *School Psychology Review, 20* (1), 67-80.

Witt, J.C., & Martens, B.K. (1983). Assessing the acceptability of behavioral interventions used in classrooms. *Psychology in the Schools*, *20*, 510-517.

Woolfolk, A.E., Rosoff, B., & Hoy, W.K. (1990). Teachers' sense of efficacy and their beliefs about managing students. *Teacher and Teacher Education, 6* (2), 137-148.

Wolf, M.M. (1978). Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. *Journal of Applied Behavior Analysis, 11*, 203-214.

Worthington, L.A., Wortham, J.F., Smith, C.R., & Patterson, D. (1997). Project Facilitate: An inservice education program for educators and parents. *Teacher Education and Special Education, 20* (2), 123-132.

Yell, M. L., & Shiver, J.G. (1997). The IDEA amendments of 1997: Implications for special and general teachers, administrators, and teacher trainers. *Focus on Exceptional Children, 30* (1) 1-19.

Yesseldyke, J.E., & Algozzine, B. (1982). *Critical issues in special and remedial education*. Boston: Houghton Mifflin.

Yesseldyke, J..E., Christenson, S., Pianta, B., & Algozzine, B. (1983). An analysis of teachers' reasons and desired outcomes for students referred fro psychoeducational assessment. *Journal of Psychoeducational Assessment, 1*, 73-83.

Zentall, S.S., & Bararck, R.S. (1979). Rating scales for hyperactivity: Concurrent validity, reliability and decisions to label for the Conners and Davids Abbreviated Scales. *Journal of Abnormal Psychology, 17*, 179-190.

Zentall, S.S., & Stormont-Spurgin, M. (1995). Educator preferences of accommodations for students with attention deficit hyperactivity disorder. *Teacher Education and Special Education, 18* (2), 115-123.

Zirkell, P.A. (1995). *Section 504 and the schools*. Horsham, PA: LRP.

VITA

Marina Enrica Niznik was born in Bronxville, New York, on December 5, 1965, the daughter of Giuseppe Campagiorni and Elisa Campagiorni. After graduating from Highland High School, in Highland, New York in 1984, she entered Syracuse University in Syracuse, New York and received a Bachelor of Science degree in August 1988, with a dual major in psychology and advertising. She entered the Graduate School of the University of Texas at Austin in August 1991. In May 1994, she received a Master of Arts degree in Educational Psychology from the University of Texas at Austin. During 1997-1998, she completed a full-time professional doctoral internship in the Department of Psychological Services in the Cypress-Fairbanks Independent School District.

Permanent Address: 16023 Birchview Drive, Tomball, Texas 77377

This dissertation was typed by the author.